

# AMAZING STORIES



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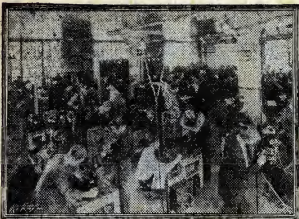
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# AMAZING STORIES

## *Science Fiction*

Vol. 10

APRIL, 1935

No. 1

### CONTENTS

#### Editorial

Leonardo of Vinci.....*T. O'Connor Sloane, Ph.D.* 8

#### Serial

Earth Rehabilitators, Consolidated.....*Henry J. Kostkos* 56  
(Conclusion)

#### Stories Complete in This Issue

The Mosquito Army.....*H. M. Crimp* 12  
The Sunlight Master.....*E. J. Van Name* 31  
The Martian Mail.....*J. Lewis Burtt, B.Sc.* 85  
Relativity to the Rescue.....*J. Harvey Haggard* 100

#### Poem

How Inventions Are Born.....*Bob Olsen* 30

Science Questionnaire ..... 133

In the Realm of Books.....*C. A. Brandt* 134

Discussions..... 136

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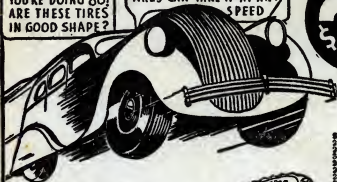
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VOLUME  
10

April, 1935  
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## Leonardo of Vinci

By T. O'CONOR SLOANE, Ph.D.

THERE is a world-famous picture in the picture gallery of the Paris Louvre. It is hung in the *Chambre Carrée*, or "Square Room," where only the best and greatest pictures are admitted. Its fame is testified to by the consternation of the world of art-lovers, when it was most mysteriously stolen some years ago. It was, however, soon recovered. It is the face of a lady with the enigmatical smile, the Mona Lisa. In its mathematical composition, for mathematics is a part of correct pictorial composition, it is characterized by a very high horizon at about four fifths of the height of the picture from its foot. This gives a very high vanishing point, but the type of the subject was not adapted to emphasize linear perspective.

There is another world-famous painting by the artist of the Mona Lisa, in which there is an arcade with pillars and which lends itself to linear per-

spective. It is the "Last Supper." Since it was painted over three centuries ago, it has been the model for almost all other paintings of this subject. A diagram of its linear perspective shows that the painting was rigorously accurate in its mathematics. The vanishing point of perpendiculars to the plane of projection is located in the face of the Saviour. It is said that Napoleon stabled horses in the great chamber in Milan, on whose end wall the world-famous painting, now sadly deteriorated, was executed by an artist who knew his mathematics. The painter of the two pictures was Leonardo da Vinci, Leonard of Vinci. Vinci was a fortified hill village in the Florentine district of Italy.

Born in 1452 and dying in 1519 he lived in the days of the first printing and of the discovery of America. In the Encyclopedia Britannica, he is entitled, "painter, sculptor, architect, mu-

sician, mathematician, engineer and natural philosopher." Not everyone, familiar with the little that we possess of his artistic work, knows that he was an inventor, so far in advance of his time that his work only in small part took shape in actual production of machinery and engineering works.

To-day in many cities endless delay is occasioned by the green light and red light system or other method of controlling traffic. Leonardo da Vinci four centuries ago described and illustrated by a free-hand, masterful sketch,—a system of high and low level streets, in present language, subways. It is not going too far to say that his sketch suggests the Pennsylvania Railroad Station in New York. If subways, such as suggested by him for vehicular traffic were introduced in difficult street intersections to-day, and it is probable that they soon will be, a great advance over the present surface transit would be made. It would bring us up to the suggested engineering advance of past centuries, of nearly four hundred years ago. Leonardo was probably the first inventor of the subway in cities.

Then we come to river crossings, and the engineer has shown three kinds of drawbridges to admit the passage of boats with masts or high deck-structures. These bridges turn on a vertical axle, as it may be termed, on one side of the river and a counter weight is provided to keep them balanced. In one case a canal is shown with a recess for the drawbridge to enter when open, leaving the entire width of the canal clear. The operation of the bridge, as he shows it, is that of a door or gate.

One of his beautiful sketches is a view of a group of workmen loading a great cylinder, perhaps a cannon, upon a truck. This sketch, for such it may be termed, is a masterpiece of drawing and the multiple tackle and windlasses

for raising the casting are admirably shown.

And these engineering projects, were evolved by one of the world's greatest artists—the painter of "The Last Supper" and of the "Mona Lisa." His free-hand sketches are examples of art in many cases, as well as of mechanics. In the simplest of them the artist and the engineer makes his presence felt.

The soldiers in those days were often mercenaries, hired at regular wages with chances of plunder thrown in. We are told that sometimes soldiers of one nation would face others of the same nation, hired to be enemies for the time. The Swiss were used often as mercenaries. Louis XVI had Swiss guards in his service, who perished in the Revolution. George the Third sent Hessian mercenaries to fight the Continental forces in North America.

— We find Leonardo devising appliances for repelling besiegers. In his era, cities were often surrounded by heavy walls. The city of Chester in England still has the old walls in perfect preservation. These fortifications were often too massive to yield to battering rams, so one attack was to put ladders against them, and go over the crest. To defend a walled town from this form of siege the artist-engineer devised a simple plan. On the outside of the wall, near its top, there was a series of horizontal beams which were actuated by bars passing through holes in the wall directly back of them. These were pushed out and drawn in by long vertical levers operated from the inside of the wall.

When ladders were set up against the wall and soldiers started to ascend, the long horizontal bar would be pushed outwards by the men inside the wall operating long vertical pivoted levers. These would push the horizontal bar outwards and throw the ladder with its soldiers over backwards. The horizon-

tal bar would then be withdrawn and held in readiness for the next assault with ladders.

Leonardo gives an amusing sketch of the operation; one man looking through a porthole, or better peep-hole, near the base of the wall to direct the work. The bars when withdrawn, sank into recesses in the wall so as not to be too obvious or too accessible for the enemy.

To win the war of 1870 (which they eventually lost) the French came out with the famous mitrailleuse, a gun with a number of barrels, so that each discharge could send out a volley of projectiles. And going back four centuries we find sketches by Leonardo of various types of many-barrelled guns, each of them a true mitrailleuse, except that they were not breechloaders. Some were to be built with parallel barrels. Others had barrels radiating like the sticks of a fan. These were the predecessors of the machine gun of the present day.

Leonardo, in his description, calls these multiple barrel guns, "death organs," reminding us of Longfellow's poem on the 'Arsenal in Springfield.'

One very curious multiple barrel gun, had a transverse prism or carriage, operating on a transverse shaft across the gun-carriage. Each side of the prism, as we may term it, carried a number of barrels so that in one sketch he shows no less than eight sets of gun barrels, each set comprising nine barrels. These, by turning on the transverse axle, were brought into play nine at a time, giving a total of seventy-two shots.

Leonardo made many suggestions for breechloading cannon. The trouble seems to have been, that the breech blocks did not effect a gas-tight closure. An incomplete sketch shows the application of a conical screw cut upon a

periphery of the breech block to screw into the breech of the gun.

He preceded the Wright brothers in his work on airplanes. He was greatly interested in flying machines, which, as there were no motors, were to be propelled by the pilot or solitary occupant. He gives several sketches and it is curious to note that while his motorless airplanes were never able to fly, in recent years flights of well over a hundred miles have been executed by gliders—motorless airplanes.

He gives us a number of sketches of these airplanes, which apparently were never experimented with, on the full size at least. The secret of the motorless airplane or glider is to make the air currents do all the work. But it was not until years after the development of the motor-driven airplane, it was only within a few years that the truly wonderful flights were made with gliders. Leonardo very naturally went to the flying bird and hoped to have the occupant drive his plane by his muscular power. And now soaring is done without any exertion of the person it transports in the way of propulsion, reminding the observer of soaring birds.

The most prominent of Leonardo's ideas of flying was to follow out the action of a flying bird. The operator was to actuate two wings, using arms and legs to give them the motion of the wings of a flying bird, not adopting the flight of a soaring bird such as the condor, that soars in the upper air with almost motionless wings.

Some of Leonardo's drawings of airplanes show quite clearly how the operator lying on his face strapped down to a board could work with hands and feet to actuate the wings. In one drawing the pilot is shown lying on the flying machine, one leg drawn up for the backward thrust. In other sketches

the machine is illustrated without any operator. The drawings are lettered and like the letters in the text of the descriptions, the letters are reversed. It is sort of "Alice in the Looking Glass" writing.

Attempts at soaring, some meeting with a considerable or appreciable success, go back to a French sailor, Le Bris, in the '70s of the last century.

Otto Lilienthal, a German engineer, began experimenting with gliders in 1867, associated with his brother. He built a man-carrying machine in 1891 and made a number of glides, eventually losing his life in one of his flights. In America, Octave Chanute came to the United States, and sixty-four years old, began experiments in gliding. He made 2,000 flights without an accident.

Leonardo seems to have had firmly fixed in his mind, that a propelling force was necessary. There were no motors in those days, so he relied on the occupant to do the driving. It was nearly four centuries after Leonardo's time that some degree of success in gliding was attained. Then the light weight internal combustion engine

plant made true motor propelled airplanes.

The gyroplane, carrying four wings rotating on a vertical axis above the body of the plane, has excited much interest in the last few years. It is the most radical change of recent times. Centuries ago we find a drawing by Leonardo of a helicopter almost a gyroplane. This had to be rotated to make an ascent, but the way of rotating the wings is not told us.

The oldest known description of a parachute is given by Leonardo with a sketch, and quoted dimensions. It is to be of the shape of a pyramidal tent, 12 ells wide and of the same height, the apex is upward. This shape ensures its strength. An attempt was made in recent times to use a conical parachute, apex downward, but it collapsed and killed the experimenter. Leonardo was centuries ahead of this

disaster. In his sketch he omits some of the suspension ropes. It seems that when parachutes came into use some centuries after Leonardo's days, there were many disputes as to who invented them. All the while the little sketch of Leonardo's gave him the definite credit.



*The first suggestion of a parachute.*

# The Mosquito Army

By H. M. CRIMP

*It is interesting to note that this story comes from an author in far distant Australia. We have had a number of stories depicting the insect world, but here we believe is the first description which has appeared in our pages of the mosquito, in which the insect, generally regarded with little favor, is depicted as doing a great service to civilization.*

FRESH from his triumphs over invading hordes of locusts which had almost depopulated the world, Professor Scott felt the urge of an Alexander to add fresh victories to his late success. Fame, fortune and, with the latter, leisure, were now accorded him; but leisure to him meant just more and more unfettered opportunities for work—at tasks which interested.

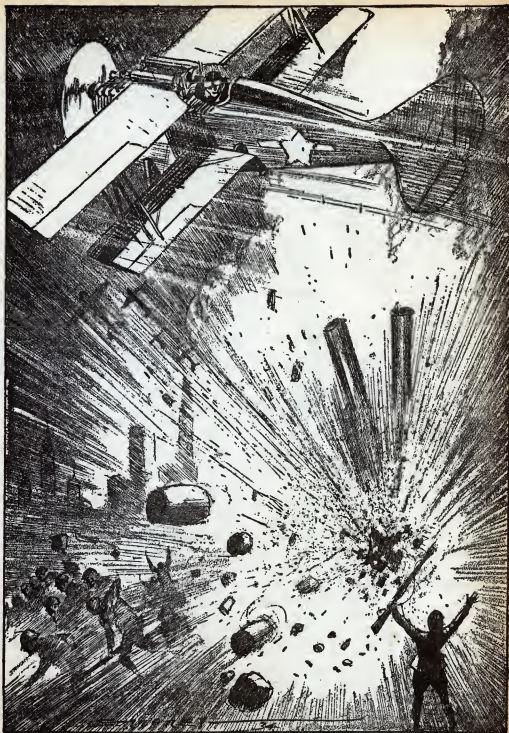
He had before him a boundless unexploited field. He had set himself a problem which was to understand life and to control insect movements, by an inside knowledge of the laws and impulses which affected insects as they lived and moved and had their being. He aspired to learn insect language, as it were, and to inspire, guide and control insects by speaking to those humble beings in their own speech or through such rudimentary agencies as supplied its place. Since, however, such primitive intelligences could hardly be expected to rise even remotely to the possession of a language, his actual aim was to discover the psychological causes of insect movements, migrations, plagues, the motive power behind instinct, to see if he could solve the mystery sufficiently to change the instincts of harmful insects, and to teach them less obnoxious habits, or even readjust their ways to be of service to mankind.

Professor Scott was a visionary; he glimpsed pictures of spiders spinning long-stapled threads which machines would weave into a stronger, glossier and better silk. He saw caterpillars no longer ravaging the leaves of the vineyard but assisting the farmer to eradicate the harmful tares of the soil. He saw the humble fly so reformed that it became a scavenger which removed filth, but did not make itself a menace by carrying pollution into undesired places. He saw . . . other visions; they were many, and the problems they suggested were absorbing and varied; but they all focussed into one pertinent question and that was—which should he attempt first and where begin?

The Professor had already achieved considerable success in ordering the direction of a locust migration and inspiring it with vigor; but that had been a very elementary achievement compared to what he now projected. He looked around. Insect pests swarmed everywhere,—moths and caterpillars, grubs, flies, mosquitos, spiders, beetles . . .; there was no limit to opportunity, but work for his lifetime and for many workers after him. Where should he begin?

Chance decided him. The cotton fields were at the time being threatened by another devastation of that small demon of destruction, *Anthonomus Grandis*, the





*Where the cities were of the older type, buildings of stone and brick, the high explosives disintegrated them to powdery dust and flung up mighty spouts of pebbly splinters to fall in a jagged hail miles away.*

cotton boll weevil. This pest called, also, the Mexican boll weevil, had reached Louisiana in 1905, coming presumably from Mexico, and had achieved such a power of destructibility, that in 1907 it had destroyed \$25,000,000 worth of cotton crop. Its destructive ability since then had cost the cotton growers millions of dollars, and the prospect was that it would continue long to be a pest.

Professor Scott considered the weevil.

"Since the boll weevil," he remarked to a young science student, Jimmy Blake, who had joined the elder man as disciple and assistant, "since the boll weevil pierces the cotton boll and lays its eggs inside the young flower buds, the problem of destroying eggs or larvae by sprays or fumigation is practically impossible. We must attack the problem by much more subtle methods and either change the weevil's habits or influence it to change its taste for cotton. Anyway we'd better journey down to the cotton fields and study the problem from the beginning."

"Good idea," agreed Jimmy enthusiastically, "Let's go."

So a week later Professor Scott and his assistant were camped in an isolated spot near a marshy swamp in Louisiana, beginning with enthusiasm a study of the life history of the boll weevil. Their camp location was a quiet secluded one, right amongst the cotton fields, yet hidden in a remote spot where the professor thought he would be able to work in quiet concentration. But he had omitted from his calculations one small matter, and that small omission, in the hands of Fate was to become a mighty factor in the affairs of Nations.

Professor Scott had forgotten to consider mosquitoes.

"Smack, smack." The sound followed the action of busy, unerring hands, and each smack left a splotted mark of blood from the gorged and bursting body of a mosquito.

"Gee, but they're fierce." said Jimmy Blake as he made another smack and ruefully surveyed a hand marked by several swellings. "Sure, they're a vicious lot. Why we're as bad here as if we were over-landers hemmed in by Indians and them shooting arrows into us. I vote we beat a retreat; this mosquito army's too warlike altogether to suit me."

"You've uttered good, sound wisdom there," replied the Professor, "And used a very apt metaphor. Yes, very apt; but the mosquitoes remind me more of a troop of lancers rather than of archers. They remind me of a line of knights charging an enemy. It occurs to me that if Christendom had sent an army of mosquitoes instead of knights upon the Crusades, the Saracens would have been chased out of Jerusalem without any trouble at all." He, too, viewed his blistered hands and rubbed his itching face. "Yes, we'll have to beat a retreat, and devise some sort of a counter attack. We're in the region of the malarial mosquitoes. Some of these are *Anopheles*, and though the bite of every one does not cause malaria, unless it has been previously inoculated, we cannot be too careful. Yes, let us get back under the nets and devise some sort of protection."

His mind taken off the study of the boll-weevil by the necessity of the moment, Scott was forced to consider the mosquito, too, how it stung, and how to stop its stinging.

**I**N his experiments with locusts the Professor had used an electric apparatus which sent out radiations and so influenced the insects to action. On his return to his tent he put one of the instruments into action; but it was as impotent in affecting the mosquitoes as was the fabled rebuke of King Canute in checking the waves.

"It is evident," remarked the Profes-

sor, that mosquitoes do not understand the language of the locusts. We'll have to change our tactics, Jimmy. How do you agree with that?"

"Quite well," replied Jimmy.

"There's another experiment I've often thought of trying and that's this," continued Scott. "Hiram Maxim, when experimenting with bulb manufacture, found that the humming reverberations, given out by a vibrating bulb, attracted the male mosquitoes. He experimented with tuning forks attuned to the humming sound of the females. He found that the males would cluster around the sounding fork and sit motionless. We'll try that; it might be a starting point to this problem as well as to the boll-weevil question."

The tuning fork experiment was quite successful with the male mosquitoes; it attracted them and kept them inactive. It was, however, the female mosquitoes from which they needed protection; it was they which bit—not the males. Experimenting with musical sounds, to attract the females and so entice them away from the spot where the scientists were working, the scientists had little success. The first experiment, however, gave Scott an idea.

"Previously," he observed, "I've used just a constant wireless transmission. The rhythmic idea may have something in it. What we'll do now, Jimmy, will be to drop our weevil researches for the moment and experiment with mosquitoes for a while."

"How about starting with an audible rhythmic wave and gradually shortening the wave-length, stopping and starting with some sort of regularity as if repeating a letter in the Morse code," suggested Jimmy Blake; "making it a rhythmical transmission?"

"Exactly. We'll see if we can achieve something in that way," agreed the Professor, bending to the controls and mak-

ing adjustments upon his transmitting apparatus.

So the Professor sent out rhythmical impulses which at first were audible as a faint, shrill, persistent and very irritating hum. He alternated his message with pauses of varying length—hummmmmm, pause hummmmmm, pause hummmmmm and so on. He varied his time and gradually shortened his length till he passed far out of the region of audibility. Then he got his first accidental success.

ALL this long-continued experimenting had been tedious in the extreme; its operation became automatic and it was difficult for the operator to keep his mind alertly upon the work. The Professor was operating the transmission key, while Jimmy lolled on a camp stool sleepily watching. Scott was considering a new line of action, the present one being a failure and his thoughts were far away. Then Blake looked up. The mosquito net at the entrance of the tent had been black with mosquitoes. Suddenly he noticed that the net was spotless. Curious he stepped outside the tent. Not a buzzing insect was to be seen. In excitement he entered the tent again. Scott had just mechanically changed to a new wave-length, and a different rhythm.

"See, see, professor, there's not a mosquito in sight," cried Jimmy to his elder, "You've clicked on something."

"Eh?" asked the operator, waking from his day-dream. "What have I clicked on?"

He stopped his operating and Jimmy explained. In the short interval another change occurred and the mosquitoes began to return.

"A moment ago there wasn't a single insect about; now they're coming back. You must have hit on something; play the same tune again," said Jimmy.

But in his absence of mind the Professor had no recollection of just what

variation of dots and dashes he had struck. He had a fair idea of the wave-length, but that was all. His note was another "lost chord," played on a different sort of organ. It was a most disappointing misadventure. He tried to recollect; he stopped and thought; he tried again; but on each and every occasion the mosquitoes remained motionless upon the net or buzzed about outside, rabid with eagerness to get past the screen.

"Well, a thing that's been done once can be done again, Jimmy boy, so there's nothing for it but a slow and patient return over all the possible paths we trod before," sighed the professor as he pondered over his apparatus. "It's a process which scientists are accustomed to—yes, only too much so. But we're going to repeat that success—for certain," he declared hopefully. With alert care he began again—to rectify his momentarily incautious lapse.

WHILE Professor Scott was toiling and experimenting to help on the cause of civilization, there were even then gigantic influences at work striving with mighty forces to wreck all established things. The East, a potent breeding place of devastation was about to send forth another horde, more relentless, more barbarous than any horde of Huns or Mongols or Tartars.

The Russian Soviet had found a new leader, a more ruthless, plotting schemer than the many that the system had so far produced. By devious and very underground ways, Krilloff had attained a power more absolute than any tyrannous sultan had ever dreamed of. He held that power by force of a subtle, scheming brain, a ruthless determination, and with the elimination of all opposition by a body guard of paid assassins.

Krilloff was ambitious with a frenzied desire, a rabid monomania. Other Soviet leaders too had had some such de-

sire; but they had been content merely to plot and dream, waiting for the ripening of slowly evolved plots. Krilloff, however, was different. Rapacious as a hungry tiger, ambitious as a super-Napoleon, he wanted immediate action and he got it. With a genius for organization, he soon had gigantic plans underway.

Krilloff's ambition was World Conquest; he aspired to be a Monarch Supreme of every acre of this habitable globe. He learned a lesson from the great World War. He reasoned that the failure of the Germans, then, had been slowness of transportation at the very start. That and surprise would not be factors that Krilloff would neglect.

Accordingly his plans were a deadly, dark secret. Under the guise of a five-year plan, a subsequent ten-year plan and some such other plan, he had masked the great and unusual importations of materials for preparation. Then, in a very secluded valley of the Caucasus, he had established a gigantic factory for airplanes and munitions. Here gigantic weight-carriers, powerful and swift, were built in thousands. Here his laboratories turned out bombs and poison gases—explosives more powerful than T.N.T., poisons of the deadliest modern arsenical compounds.

HERE, while the nations of the world droned on in listless disputations upon an impossible world peace, the Russian plotter worked to make that ideal a reality—but a reality to a world of slaves rather than to a world of free peoples. In Russia he had a secret army of millions, while the remote interior of China provided him with a carefully drilled army of coolies for all sorts of labouring jobs.

Then out of a serene sky the monstrous deluge burst. Thousands of mighty, swift, long-range planes rose up

one summer evening and sped off through the darkening night on radiating courses which ended at the capitals and chief cities of Europe.

On through the night they flew at speeds up to two hundred miles per hour. Then circling over their objectives at earliest dawn they all loosed their rain of murder at an identical moment. High explosive shells, incendiary and poison-gas bombs, rained down faster than summer hail. Indiscriminate in their aim they poured down alike upon military arsenals, commercial centres, the homes of the rich and the dwellings of the poor.

Where the cities were of the older type, buildings of stone and brick, the high explosives disintegrated them to powdery dust and flung up mighty spouts of pebbly splinters to fall in a jagged hail miles away. Where the buildings were of humbler wooden materials the incendiary missiles lit them into raging holocausts of flame which soared up like beacon lights, warning the world of tragedy and becoming the funeral fires of thousands. Explosive bombs, crashing down amongst the new constructions of concrete, skyscrapers, splintered and cracked, toppling down Science's latest building achievements into a jumble of twisted iron, broken masonry and dust.

So well were the fiendish calculations made that only in isolated instances were warnings given of the death rain from the sky; and then the time was too short for more than a thrill of terror to shake the observer before the deluge descended and terror was soothed by death. In every large city of importance the attack started at the same identical moment. Thousands of sleeping citizens were shot from slumber into eternity; thousands more were shocked into life with torn and broken bodies, to linger in shrieking or moaning agony for eventual death under toppling buildings or to be killed by deadly gases which began to spread

like the mists of night over the scenes of destruction.

To some death was sudden; to some he came with lingering, agonizing clutch; but some had miraculous escapes. Thousands of these, some quite unhurt, some hurt but not disabled, rushed in frenzied terror out of their falling houses. They formed units of terrified mobs which rushed in blind, leaderless confusion here, there, anywhere—shrieking, cursing, praying—looking for that safety which few found.

Some of these mobs rushed blindly into clouds of poison gas, wilted and—died. Others became the targets of dropping bombs and they just vanished—disintegrated. Others took refuge in cellars, under the shelters where toppling buildings had created caverns of refuge; others disdained any protection but rushed on, marvelously escaping death at every turn. These crowded into automobiles or rushed on foot away out from the centres of destruction to the comparative safety of rural seclusion. Here they escaped danger for the moment. Others kept their heads, and, filled with the nobility of heroism, began with calmness to succor and help the maimed and the suffering, as soon as day came to show them the dreadfulness of the scene.

**T**HOUGH generally there was death and destruction, here and there like oases in a desert, there were small areas where the bombs had not struck and to which the gases had not clung. Here many frenzied people gathered and here the heroic angels of mercy began their work. Here, while the gigantic planes of death soared overhead, the work of mercy went on, heroism rising superior to the paralysis of fear, when there was need of heroism.

The Russian bombardment lasted an hour. When it ended there was a scene of devastation in every city. Here



tumbled areas of smashed ruins; there blazed flaming furnaces of burning buildings. In the hollows there were settling smoky clouds of gaseous vapors of death. Here and there were left standing unscathed buildings. In one place in one city there was a tall tenement house, in which not a person was even scratched. In another a lofty concrete building escaped destruction and stood up above its razed companions like a lone monolith in a graveyard. But these areas of immunity were scarce—very scarce. The fiends of destruction had done their work well—too well, aided by all the latest helps that Science can give the God of Ruin.

The picture was the same everywhere. London, Paris, Berlin, Brussels—every capital, every city of any size—all were in partial ruins—all were centers of despair or—tombs. The risen sun saw universal destruction on the ground; and in the air the cruising hawks which had created the inferno.

All munition works, all munition depots, all military barracks had by this time been blown up or gased, so no opposition was likely. Then the first edict of Krilloff, the World-Emperor, was broadcast. There was to be no opposition anywhere. All people were to assemble at indicated spots and wait for orders. Opposition meant instant death. Cowed, leaderless, the terrified people had to submit.

Meantime racing trains and speeding automobiles were bringing Krilloff's second line of troops to the scene. Other speeding planes dropped governors, directors and slave drivers to the earth; and very soon the World-Emperor had conquered the first part of his kingdom.

In a month the free peoples of Europe had been turned into a multitude of slaves who lived and moved just as Krilloff ordered through the mouths of a million slave drivers. In a month some

order had been evolved out of chaos; and already the conscripted slaves were toiling at the work of rebuilding their cities, or at such tasks as their masters ordered.

Then Krilloff had time to begin the second stage of conquest. This was the invasion of the United States.

LIKE Napoleon in his invasion of Italy he had, however, his Alps to cross. The Alps in this case was a barrier quite as formidable—the wide Atlantic Ocean. Though he had gigantic air-planes capable of carrying a hundred tons each, and speeding at two hundred miles and over per hour; though he had bombs with a mighty power of destruction and thousands of trained troops; yet he did not now have an unsuspecting, helpless people to attack; nor did he have his objective comparatively handy to his base. Krilloff's attack on America was to be no easy task, so he took time and consolidated his forces. Nevertheless two months after his air-ships had rained terror over Europe, his air flotillas rose up in their flight to Western conquest.

The people of America had in that two months a period of anxious warning and of frenzied preparation. Their engineers had designed deep, bomb-proof shelters below their cities. Their chemists had compounded and compressed many cylinders of neutralizing gases. Their manufacturers had made gas masks and other protective devices, while the military had burnished up the arts neglected during peace talks, and were ready with fighting planes and anti-air craft guns. Truly when Krilloff's hordes came he would not find a waiting, helpless foe.

The Soviet air fleet was met in mid-Atlantic by the picked fighters of the United States' air force. The faster, bigger, more powerful planes of the in-

vaders simply soared up over their attackers and, from above, their hail of incendiary explosive bullets did the rest. The defending fleet never returned.

Quebec in Canada was the first city attacked. Then a base was established on the plains adjacent to the city. From here the far-flying planes would attack Chicago, New York and other American centers.

The defenders driven from the air, and their armies wiped off the outward surface of the earth, the invaders apparently had it all their own way. Thanks, however, to their two months of superhuman preparation, the nation was in a position to protect itself for a time. In the cities all underground cavities had been prepared as refuges—cellars, underground railway tubes, sewers even, drained clean, and all joined by intercommunicating passages. Food, water, air-purifying plants were all provided and the people of the cities went into the earth to escape for the moment the expected fury of the enemy. The cities were cleared of inflammable materials.

In the country natural caves, mines and tunnels were all brought into use and filled to their limit with scared refugees. Krilloff's attack thus found a nation ready and his attack caused little loss of life. Though modern buildings went crashing down, each heap of debris served merely to bury the underground refugees under a deeper rampart of protection. Thus the Soviet attack soon developed into a siege.

As soon as possible the invading forces formed armed camps about each city and began an abortive attack upon the tunneled-in people. Then the military took their turns and issuing from unexpected outlets carried on an irritating, guerrilla warfare with light guns, firing gas bombs and shells. It was, however, a hopeless defense. Soon starva-

tion and suffocation was the certain fate of the cooped-up refugees. The forces of the Soviet had merely to police the surface of the ground and surrender was certain.

IT was while he was absorbedly concentrated upon the re-discovery of his lost formula that the first news of the outbreak of barbarism reached Scott.

"Dot—dot—dot-dashhh; dot—dot—dot-dashhh." his soundless transmission was speeding forth. "Dot—dot—dot-dashh."

Jimmy Blake came in hot and excited.

"There's another war broken loose in Europe; here's a paper full of it." he cried dropping some packages and opening his journal.

Scott looked up with the far-away gaze of an absorbed scientist.

"Don't interrupt, Jimmy," he jerked out peevishly, "I think I remember just how I struck those keys. Just a moment and I think I'll get it." He bent to his task absorbed, oblivious to all outward happenings. The heavens could have fallen at the moment but Professor Scott would not be moved.

His concentration was justified, for within half an hour the Professor struck his lost chord again. It happened in a moment. As he played his noiseless rhapsody, this time with his mind keenly upon his work, he noticed a sudden movement amongst the mosquitoes about the nets before the door. He had barely played his tune for a dozen beats when they all rose up in a cloud and flew off. He stopped; so did they and began to drift back. He started again, and again his silent melody inspired the insects to action.

"I've got it Jimmy," Scott cried exultingly. "I've got it." Before such a discovery the greatest crisis in far-off

Europe was of the very smallest concern—to the absorbed scientist.

Taking the fullest record of his wavelength and the exactness of the periodic variation of his transmissions, Professor Scott and his assistant worked out many diversifications of their theme. They found, after some weeks of trial and experiment, that they had compiled a code of signals which had wonderful effects upon the action of the mosquitoes.

Their first crude success had been to stir the mosquitoes into action and cause them to fly from the transmitter. When Scott proposed to delve further into this, Blake was surprised.

"Why?" he asked. "We've done all we wanted! we found a way to scare the pesky things from the tent, so that we can go on with our weevil researches untroubled."

"Why?" Scott repeated. "Why? Don't you see that we have got a starting point with another insect as well as with locusts. If we follow this up and compare results we may get such results as will make our study of the weevil the simplest of matters. No, we will go on. In science it is always best to follow the discovered track, even though it may not seem to be leading where we want to go. So let us do some more experimenting along the lines of our discovery."

The decision was sound since result followed result. Their earliest transmission they found had been crude and comparable to an attempt at producing stirring martial music by an untrained orchestra playing discordant instruments. By careful modulation of wavelength and rhythm the Professor found that his song had become more tuned to definite harmony. Now his ray did not excite the insects to a wild, frightened scurry, but to a steady purposeful flight, a flight away in a defined direction, not away to every point of the compass. He found he could vary the direction by slight

variations of his transmissions. That in itself was a wonderful achievement.

THEN he made an epochal discovery; he found that one of his variations caused the insects to assemble around the adjacent marsh and deposit eggs. He stopped at that and reasoned out his results. His conclusions were that his transmitted waves were acting upon the nervous systems of the insects and getting action in much the same way, but to a greater degree, that a good dance band will create an almost irrepressible desire to dance. On that theory he continued his experiments, microscopic and other tests going to prove the correctness of this supposition. Then results came thick and fast.

He could collect his mosquitoes around him in thick swarms or could scatter them in all directions. He could send them off in any direction; he could stimulate or retard their laying desires; he could also stimulate or retard their capacity to bite or feed. In short the Professor was attaining a complete control over the insects. He was elated to the realms of transport, so much so that the downfall of Europe became a matter of small moment to him. Then the invasion of America occurred; but it was not till bombing planes came roaring past, after the razing of New Orleans, that he woke up to the realization that tragedy was afoot.

When newspapers ceased to come, as mail transport stopped; when all wireless stations had closed up on broadcasting; then Professor Scott closed down upon his experiments, to look at reality.

His camp had been chosen for isolation. It was well stocked with stores so he was not disturbed by the invaders nor troubled yet by scarcity. The inhabitants in the surrounding cotton-fields had not yet begun to suffer from the

invasion; but all were filled with the wildest fears. New Orleans had been blown into a shattered ruin, and several other towns had been scared by an occasional dropped bomb, but otherwise no harm had come to the rural regions.

On the other hand the wildest rumours were current regarding the situation at New York, Chicago, Washington, Philadelphia, Boston . . . everywhere where there were large centres of population.

In the cotton fields a few, a rare few, went on undisturbed with their rural pursuits. Most of them, however, particularly the negro element, collected in groups and held wild, excited religious séances. Others began frenziedly to drain wells or clean out cellars, provisioning them for hiding places. Some of the well-to-do filled up their auto cars and loaded on necessities and began a wild trek, a new generation of overlanders, to the Western mountains. Everywhere there was excitement, frenzy, fear and concentrated anticipation of danger.

Awake now to the dreadful reality, Professor Scott went about the cotton fields getting all the information he could. Jimmy Blake accompanied him, the latter quiet and stunned with the numbing realization of the disaster. They pieced together the wild rumours and sifted out the false from the fact, and then realized that most of the big cities were in a state of siege by an enemy whose strength was being increased each day.

"You once said that it would have been better to have sent mosquitoes to attack the Saracens in the Crusades than knights." Jimmy Blake said to Professor Scott. "Considering your command over mosquitoes, wouldn't it be a ripping good idea to send a few billion buzzing about them Bolchevics

and keep 'em busy, while our men have a crack at them."

PROFESSOR SCOTT came out of a cloud of thought, "Jimminy, yes," he said unprofessionally. "You get good ideas at times, Jimmy, my boy. A mosquito army, malaria, instead of poison gas, or bombs. *Anopheles* instead of airplanes. Jimminy yes. You know in the early days of war it was disease which did more damage than all the spears and arrows, guns and bayonets of the enemy. Now, to-day, in modern and enlightened times, we will use bacteria to fight for us. Yes, Jimmy, the mosquito army is going to be a real factor. Yes, disease germs let loose upon humanity has often been proposed, but I have never heard of a definite case where it was done or where such a course was successful. A disease germ generally speaking does not have a very long and vital life when loosed broadcast, dissociated from the conditions which it needs for life. But a malaria germ introduced by its natural carrier, an *Anophele* mosquito—well—that will be another matter. Yes, Jimmy, we will enroll a new army of knights in defence of civilization. Necessity knows no law. We must conquer, or lose all that Civilization has accomplished in two thousand years. We'll see if Science can outwit Craftiness; and with the humblest of instruments defeat the mightiest."

"Well, we'll have a darned hard try anyway." said Jimmy Blake in enthusiastic agreement.

"Then that's decided," said Professor Scott, "but the actual method of accomplishment is not going to be so easy. For a start mosquitoes, *Anopheles* in particular, do not fly far when left to their own resources. A few miles, five or six per day would be a long, long journey for a mosquito. If we were dealing with locusts, now, it would be

easy. But we're not," his tone was rather regretful.

"Couldn't you conscript a plague of locusts to act as airplane carriers for your mosquitoes," suggested Jimmy with flippancy.

"Possibly, if we could create a plague in a day or two," replied Scott. "But we can't work actual miracles—not yet. No, our plan will be to arrange transport for the first contingent of our army and then breed our troops upon the actual battleground. That's a way of overcoming transport problems which no military leader has thought of yet." He added the last sentence with a twinkle of humour. Then he continued seriously, "Mosquitoes take one to three days to hatch from the egg. It takes each insect something less than two weeks to pass through the larva and pupa stages and develop into a perfect mosquito. Possibly we may be able to accelerate that rate. In any case we can be sure of breeding our warriors in a couple of weeks; and that is not so bad."

"But they will not be inoculated with malaria then?" Jimmy was curious and interested.

"No," replied Scott, "The cycle of development of malaria is like this—A mosquito bites an infected person. The malarial germ must come from a person suffering from the disease in the first place: the mosquito does not produce the germ—it merely develops and carries it. In biting a person suffering from malaria the mosquito sucks in with the blood sexual forms of malaria germs—macrogametes or males and microgametocytes or female germs. These forms enter the insect's stomach where they combine to form zygotes which again divide up into sporozoites and finally appear in the salivary glands of the mosquitos. The insects are now ready to inoculate a person with disease.

This stage in the mosquito takes about twelve days. When the mosquito bites a person a non-sexual cycle begins. The sporozoites grow and finally divide into other sporozoites till in two weeks they become so numerous that the toxins liberated cause chills and such symptoms. Finally sexual forms appear, macrogametes and microgametocytes. The bite of a mosquito at this stage would repeat the process all over again."

"Then it would take well over three weeks from the first inoculation of the mosquito to the stage when the person bitten was definitely afflicted?" asked Jimmy.

"Well over three weeks to complete the cycle of development from mosquito to man and back to another mosquito, yes; but the man will have begun to feel the effects of malaria before that."

"But shall we have time to go through all this formula. Will not civilization be wiped out long before we can get our mosquito army moving?" Jimmy was puzzled and sceptical.

"NOT necessarily. You see, we have the mosquitoes under control now. There are sure to be a number of persons suffering from malaria at this moment within a dozen miles of them. Well, we'll take our section of advance troops to them and load up on ammunition—or zygotes which will be incubating as we convey them to the fighting front. Another army of pioneers will accompany us. These latter will be all the *Anopheles* which we can gather together. These we will stimulate into laying eggs and by the time the advance guard has started the epidemic in the enemy the pioneer troops will have finished laying and be ready to inoculate themselves with germs. When they are ready to enter the firing line, there will be millions of young recruits



hatched out to supply the wastage in the ranks. It's a sound idea, don't you think?"

"Too right it is," agreed Jimmy. "When do we start?"

"Just as soon as we can find a few cases of Malaria for initial ammunition and a couple of closed motor wagons to fit up as transports," replied the Scientist.

Their initial preparations did not take long. They packed up their indispensable transmitting machine on their own automobile and set off on an exploration for equipment.

. . . . .

FROM his location north of Lake Pontchartrain Scott drove northwards through Mississippi calling at each small town and scouting around to enlist all suitable persons he could find for his enterprise.

So far, a little over a month from their first landing, the invaders had accomplished very little in actual conquest. In the cities the inhabitants had dug in securely. Chemists had discovered efficient antidotes for the enemy's gases, and the military had contrived by frequent and unexpected sorties to hold the Bolchevics in check. Food however was growing scarce and the air-purifying machines were hard put to it to keep the air healthy. There was no chance at all of victory and small chances of holding out for long; yet none of the isolated and entombed communities even thought of surrender.

In the rural localities, those removed from the larger, besieged cities, there had been little disturbance from the enemy, as yet. Hence Scott and his companion were unimpeded in their movements.

Here and there they picked up suitable men around the small towns. Several were local doctors, all specialists in mal-

arial diseases; another was an entomologist studying Coleoptera, a lucky find. Then there were several electricians and a motor mechanic.

Called together as a committee in a tumbledown shack, the whole fourteen of them were keenly enthusiastic and formed themselves into the general staff of the Mosquito Army.

The first essential was the manufacture of a number of Professor Scott's electrical transmitters or mosquito controllers. While these were being got ready, the motor mechanic had discovered five suitable wagons and began overhauling them and wire-netting them in for mosquito transport. The medical men had no difficulty in providing malarial patients who would supply the inoculation virus. Professor Scott and Jimmy then conducted classes of intensive study to acquaint all with the procedure to adopt.

The Professor took the post of commander-in-chief, with Jimmy Blake and the entomologist, Gordon, as his chiefs-of-staff. The four doctors, Bremer, Barbour, Mencken and Sanders were each styled generals and put in charge of a wagon, or army corps. The electricians became the intelligence corps, and the mechanic the chief of transport.

That being accomplished, the Professor set about his selection of mosquitoes. His methods of control was by no means so thorough that he could make a selection of the various species. However, by careful investigation he was able to fill his wagons with a greater number of *Anopheles Quadrimaculatus* and *Anopheles Crucians*, both vectors of the worst forms of malaria, but many others, some *Culex* and some *Aedes* became included.

"THEY'LL all help the general scheme," the Professor commented as he surveyed his catch as they clung

to sheets of cloth suspended from the roofs of his transports. "If they cannot do other damage they at least will keep the enemy on the move."

Under the influence of a soothing ray which silently purred its symphony, the Diptera were passive and quiescent in their captivity, the resting pose of the Anopheles, with an angular position of body as distinguished from the parallel position of the others, marked the actual warriors of the army from the merely irritating irregulars.

"Would it not be possible to infect the enemy with much more deadly germs than malaria?" asked Jimmy Blake.

"Possibly," replied Scott, "but then one never knows just how such a course may result. In the case of malaria, it is not its actual death-rate which is its greatest evil; it is its sick-rate, its destruction of efficiency, which makes it a scourge; and it is that very quality which will be of the greatest benefit to us. We shall not be endeavoring to kill our enemy in actuality, but we shall be incapacitating them while our soldiers, our human army, gets a chance to come out and fight. Carter, in one of the United States Health Service publications points out that with Typhoid 1% is a bad epidemic; but 40%, 60% or even 90% is common with malaria. So you see we might loose a scourge of typhoid and only incapacitate a few of the enemy; but with malaria we might render the whole force incapable. No, it seems to me that we could not have gotten a more perfect defence force than our mosquito army, for with it we can attack at a distance quite securely, while with our mosquito controllers we can guide the direction of the attack and intensify it as we like. No, it seems to me that we could not have picked on a more perfect attacking force, if we had specially bred mosquitoes for the occasion."

Everything being ready, including the

feeding of the Anopheles with infected blood, the army moved off. The plan of campaign was for each of the five wagon units to proceed to the five chief cities being attacked, there to get under cover and begin the onslaught. Scott, himself, chose New York; Doctor Bremer was to go to Washington; Barbour to Boston; Mencken to Philadelphia and Sanders to Chicago. If successful there, each unit was to move off and go to the help of the next nearest city. By carrying out this plan and by enrolling any help available the Commander-in-chief, Scott, hoped to have his Mosquito Army in full attack within a month. Gordon was detailed for general supervision and Jimmy Blake to get in touch with the besieged military authorities and acquaint them with what was being attempted.

Over a thousand miles of travel lay before the wagons. Luckily the supreme egotism of the invaders, and their extreme contempt for their opponents had lulled the Russians into neglect of all outside their chief objective, the overthrow of the cities. The rural districts were left alone except for levies of food-stuffs. Hence the mosquito transport met with no opposition, beyond the great difficulty of getting motor fuel. Several days of hard travel brought the army close to its objective. The different wagons then separated and Scott went on alone with Jimmy and the mechanic.

"Won't these here germs, you got, go and kill all the mosquitoes?" asked the mechanic in curiosity.

"Oh, no," answered the Professor, "not at all. That's the peculiar part of the business; no malaria germs are harmful to the mosquitoes themselves, they are hurtful merely to man. Another point worth noting is that each mosquito may infect several persons; so our present brigade of mosquitoes is probably quite capable of enough mischief in them-

selves without breeding a new host to follow after."

IN an immense circle around New York the invaders had pitched their camp. Rather they had taken possession of most of the finest homes on Long Island, and on the mainland upon the banks of the Hudson. Here was a scene of activity, planes flying above, frequently dropping bombs which burst with mighty shattering explosions.

There were not many troops noticeable on land; but Professor Scott was not a keen observer. He was too anxious to find some place of seclusion himself to trouble about the enemy at that period. At length a place of refuge was found where an immense concrete factory building had been blown up. Here under a cavernous shelter formed by great slabs of concrete, they scooped out a place for themselves and their motor.

Quickly they established themselves. The motor engine was used to develop electrical power, and immediately all the infected Anopheles were liberated and sent out with an urgent electrical impetus to scatter across the besieged area. The transmitter sang its silent song all the afternoon and far into the night. By that time the mosquitoes had spread far into the enemy lines and the first stage of the campaign had begun.

It had been decided that Jimmy Blake should endeavor to get into communication with the authorities who were known to be dug-in under the wrecked city. It was a difficult undertaking, not so much on account of the enemy lines, but because of the difficulty of finding the entrances to the subterranean city.

Jimmy set off, well guarded against mosquito attack, and well armed against the besiegers. It was one hour after 12 P. M. on an autumn night. A haze had settled over the ruined landscape

and there was the first tang of a winter chill in the air. For a while Jimmy threaded his way along streets of deserted houses, where there was little wreckage. Then he came to a more devastated area and had to probe a way over and around shattered piles of wrecked buildings.

Except for an occasional plane which droned about overhead, wheeling and twisting in a casual observation, he did not see any of the enemy. He wondered at that; but concluded that the Russians were so self-satisfied at their invincibility that they did not trouble to post guards.

In two hours of hard going through a sterile desert of broken masonry, he met no sign of humanity. Growing careless he hastened on, being well into Jersey City. Then suddenly he met adventure.

He was wandering along a street where the tall buildings on either side had not been victims of the invader's shells. The night was very dark and misty. Suddenly the street ended in open land, a park. Jimmy strode on and found himself right inside an enemy post. It was a landing ground for enemy planes.

Little clumps of shubbery formed a dotted border around the open land and into the shelter of one of these Jimmy darted. A far, over the field, a plane was just landing, and here were the only lights, glares showing upward. In the glow he could see men. Thrilling with the excitement of a first adventure, Jimmy crept to the next clump of shrubbery and on to the next. Then to the right, at the front of a tall building there were signs of drowsy life. Once amongst the enemy fear seemed to leave him and he felt he must find out all he could. Taking advantage of the shadows he crept as near as they allowed.

IT was approaching dawn; he had little time for spying; but he was keen. Then he noted a fact which filled him with elation. Though speaking in Russian the actions of the sentries were sufficient—they were smacking and scratching at mosquitoes.

"The plot's working," muttered Jimmy, and went on.

The contemptuous carelessness of the sentries created a corresponding carelessness in Jimmy. He walked on less stealthily, passing across the open land quite safely. Then as he was about to pass again into the newly devastated streets he came right amongst a group of Russians.

They too were cursing in low tones and using much energy in smacking invisible mosquitoes. All this Jimmy saw in a flash. Then the others saw him and a chorus of friendly greetings were shouted at him, or such he deemed them. If he had understood Russian he would have passed the crisis safely; but he did not. For a moment he stood still—a moment too long. Suddenly suspicion entered the minds of the enemy and a hoarse shout roared.

That shout galvanized Jimmy to action. Up went his automatic and "Spit, spit, spit" darted its defiance. Two men went down in front; and Jimmy dashed forward. Like a charging bull he went forward his gun spitting, "Bump" he was into a fat Bolshevik. There was a grunt as the big man collapsed and Jimmy was through.

He dashed on into the darkness. The black night behind him was lit with spurting jets of flame where the Russians fired at his dim figure. A mass of ruins formed a mountain ahead; Jimmy bounded up the declivity and took refuge behind a slab of concrete. From here his gun flashed back, and there was a spirited gun fight in the darkness, each side firing at the gun

flashes, but beyond the nerve-wracking experience of a hail of bullets smashing around him, Jimmy was not hurt.

The roses of dawn suggested the need of escape, a need made urgent by the arrival of new troops, coming up excitedly with a machine gun. As the gun began to shower its hail, Jimmy slid down the ruins and ran. An encircling file of Russians was even then working around to cut him off. They did not see Jimmy at first, so his introduction of himself straight down a sloping hill, was sudden and irresistible. "Spit, spit, spit . . . Bump." His gun gave warning first and then his shoulder crashed into another enemy, and he was through again and away.

A narrow lane opened before him and he dashed for its dim security. With a roar the Bolsheviks bounded after him shouting and firing. Jimmy ran, not returning the shots to give his enemy less idea of his direction. He ran on, here blocked by almost impassible piles of debris, finding a way there through unexpected passages, managing to keep ahead, evading capture, missing bullets by Luck's merest margin.

The chase went on relentlessly the dawn growing clearer to help his pursuers. Jimmy rushed on, running, climbing, sliding, dodging, as the debris allowed. Then for some minutes he saw no foe and heard no shot. He slowed down to let his panting heart get rest; he felt he had got clear away. A mass of ruins blocked his path; he crawled over; slid down beyond; stepped incautiously around a jutting heap and walked into an open space full of Russians.

Their roar plainly meant surrender. Any other course was hopeless and Jimmy threw down his gun. At that moment the crackle of a machine gun burst out. Bullets sputtered across the ruins and the Russians began to fall. In

a moment it was all over and Jimmy stood bewildered, the sole survivor of the scene.

Too astonished to run, he remained still. Then from behind a taller mass of ruins there stepped into view a lieutenant of the United States Army.

"Here, you," he called, "Who are you?"

"An American looking for some way of joining you boys underground. I've got news for the man in command."

THE message Jimmy Blake carried to the despairing, cooped up refugees changed despondency into high hope. Buried as they had been in ill-lit, badly ventilated dungeons, in a crowded underground city whose only streets were narrow telephone conduits, smelly sewer pipes and hastily dug communications, it was not to be wondered that sickness had begun to take its toll. Now there was a chance of liberation and hope ran high.

The underworld had been well organized; there were telephone lines of communication to all the principal cities and to all large underground shelters. Thus Jimmy's message was passed around and preparations were made for a general support of Scott's plan.

Soon news came through that all the other army corps of mosquitoes had arrived and that everything was going according to schedule. Then Jimmy Blake decided to return to Scott's camp. He was shown the nearest secret exit of the army and speeded on his way.

"Everything's going O.K." he reported as he greeted Scott. "All the others have arrived and our stunt is a sure winner." He then went into full details of the plans he had arranged for a general attack, as soon as there was definite evidence that the mosquitoes had done their work.

They had. Before many days had passed it was very evident that a very bad epidemic of malaria had attacked the Russian camps. From each broadcasting center the wireless messages had gone forth and spurred the insects to ferocity in their attacks. The uninoculated insects, too, had been equally zealous. They had gone forth and in every place where there was moisture at all they had deposited their eggs. Every pool and laklet had been covered with floating eggs. Water butts, open drains, rain water puddles, all and each had a teeming population of wrigglers. The unsanitary habits of the Russians contributed also to their own downfall. They left filthy pools of spilled water around their camps and tins of liquid in untidy profusion. Into each of these welcoming refuges the mosquitoes entered and each in turn became a prolific breeding place.

The egg-laying battalion having done its share of the good work, they flew off to the attack. Plasmodium, parasite of malaria, was now reaching the right state of development, so the second line of the mosquito attack was able to absorb macrogametes and microgametocytes in preparation for their eventual transfer to the first line.

By this time the enervating toxins of malaria were getting in their good work. Already a great percentage of the Russians were incapacitated. This was very evident from the fewer number of the scouting planes overhead. The actual number of the efficient enemy was not yet materially lessened, since each day Transatlantic liners were landing thousands of troops. But for the mosquito army the country would have been hopelessly overrun. Mosquitoes, however, were being bred in millions so each shipload of soldiers merely served to feed the insatiable rapacity of the insects.



AT this stage the impatient troops underground wished to attack; their cramped quarters had become so unbearable; but Scott held them back. The time was hardly ripe. Luckily for the Americans all local population had emigrated from around the besieged areas. Underground the defenders had to exercise great vigilance to prevent the invasion of the mosquitoes; but nets at the secret entrances and fumigators protected them from danger.

The Russians, however, were caught entirely unprepared. Swelled with conceit on account of their easy conquest of Europe, they had not prepared for long opposition. Medical necessities had been made very subservient to munitions, while such a possibility as the mosquito attack was, of course, quite unprovided for. The high command, quite careless of the comfort of the fighting troops, took no precautions in the beginning. Afterwards, when they were themselves driven frantic by the torment of insect bites, it was rather late.

Each day thereafter brought the mosquito attackers in their millions and billions. By this time the malarial trouble had grown from a mere plague into a disaster. In vain did the Medical Staff frenziedly seek some remedy. In vain, for their knowledge and equipment were quite unable to cope with the calamity.

With amazing rapidity the disaster became a cataclysm, a catastrophe beyond all repair. Panic seized every combatant, from the highest officer to the meanest soldier. It was not so much the number of deaths; they were comparatively few; but the deadly sickness which prostrated all. With panic came the rush to escape. To the chills and fever of the early symptoms was added the frenzy of fear. The officers first afflicted hastily crammed themselves upon the airplanes and headed homewards, in retreat. The lesser troops in a mutin-

ous rush seized all shipping idle at the wharves and put to sea. Others crowded aboard the arriving troop ships and forced their crews to return.

Disaster, however, overwhelmed most of these runaways; disease overtook many of the flyers and their planes dropped down to watery graves. A similar fate met most of the unskilled seamen who took their ships to sea. Just the same many did reach Russia in safety.

At this stage Professor Scott gave the signal to end the war. Changing their commands the electrical mosquito controllers called the insects from the battle ground and herded them together into a neutral area where they were held, pending further use of their deadly bites. Then the American soldiers issued forth.

But they had no need to come as fighters; rather as rescuers. Of their foes there was barely a man capable of resistance; all had either gone down before the calamity or had escaped. The army—for all men had been conscripted into soldiers—came out, every individual panting to have just one hit at their former gaolers; but in a mixed state of chagrin and joy found that their part was to stack arms and take up the duty of hospital attendants or gravediggers.

. . . . .

IT was well into winter when the nation had counted up its losses and got reconstruction under way. All the tottering convalescent enemy had been shipped back home and all their dead buried. Then the people began the heavy task of repairing the devastation of war.

The number of enemy killed or dead was not so great, nor the defeat so great as to be decisive. The Russians did not know of Scott's part in their

overthrow, for it was kept as close a secret as possible. The enemy thought that some unforeseen epidemic, due to a plague of mosquitoes, had devastated them; and it was an open secret that a new and far more terrible invasion would be made in the ensuing summer. The American nation waited that event with dread, for they presumed that the Russians would return prepared for all eventualities.

Krilloff with terrible oaths urged on his staff and the knout twirled and smote in every munition factory of Europe, as slaves toiled feverishly to fulfill the tasks of their masters. A mighty, a very mighty, armada was being built.

Spring came, and the great air and sea fleets were almost completed. Mighty bombs and millions of cylinders of deadlier gas were piled at the dumps. America got discomposing reports of all sorts. Her people toiled to prepare for the new attack, but rather despondently. Scott marshalled his mosquito army but without enthusiasm; he did not expect results this time—wanting the element of surprise.

AS the winter snows melted in the south of Russia and the earliest grass shoots began to push up, no one bothered to note the presence of mosquitoes, particularly around the hangars which housed the war planes back from America, and around the docks at Odessa where the transports were anchored. No one had leisure enough to remark this until a bad outbreak of malaria occurred at Krilloff's chief depots. Even then, with the American defeat to warn them, nothing was done.

Some one did fearfully mention the danger to Krilloff, but he was too frenziedly intent upon his new offensive and turned upon the advisor in wrath. After that no one else dared approach him. Thus it was that millions of

disease-laden mosquitoes came out of the cracks and chinks, where they had wintered and began to sow the seeds of a fresh scourge. They sowed their virus and they laid their eggs; they moved with unwonted vigor, still inspired by the energy Professor Scott had instilled into them with his machines.

Then summer came and the day of departure drew near; but that day did not come. Instead came a day when thousands of Krilloff's fighting men were prone on beds of mortal sickness, or lying dead with few to perform the last rites. Compared with this scourge, the one which defeated their army in America was as nothing. Mosquitoes flew everywhere in black clouds, active, greedy, venomous. They dared everything and got everywhere. In vain were mosquito nets spread; in vain were fumigators puffed. The insects got into the nets even as they were spread and new swarms filled the rooms as quickly as the fumes blew aside. All the Russian forces in Europe were recalled home to help attack the new enemy; but the newcomers merely came to be fresh fuel for the bites of the insects. Meanwhile the scourge was rapidly spreading Westward. All Europe was threatened.

AMERICA heard the news with horror and relief. All eyes were turned to Scott as the one man potent to be a deliverer.

In a powerful plane he set off Eastward with an escort of army planes. The Americans saw that now was the time to rout their enemy—on his ground, not on their own. While Scott flew to meet the spreading swarms of insects with a line of repelling instruments, the United States Army was organizing the people of Europe for a gigantic offensive.

The uprising was unnecessary. As Scott drove his mosquito flock back-

wards and it was possible to enter Russia, the full extent of the devastation was laid bare. It was ghastly and terrifying. Not only had disease taken a terrible toll but famine had completed what malaria had begun—thousands perishing from sheer inability to provide themselves with attention and food. Almost to an individual the nation was wiped out.

Everywhere it was the same. When

relief corps penetrated this gigantic charnal house and reached Moscow, they found that the great Krilliff had been just as mortal as his meanest slave; he lay on the floor of his palace an unrecognisable heap of decay, a would-be giant, defeated by the frailest of living things.

So Scott again saved civilization; but it was a victory for Science rather than a victory for man.

THE END

## How Inventions Are Born

By Bob Olsen

With beakers, test-tubes, lenses, coils  
A man of science sweats and toils.  
He strives to add to human lore  
A single truth—unknown before.

This infant truth a writer finds;  
He nurtures it, about it winds  
A fictive yarn that seems to be  
Preposterous absurdity.

Within the thinker's fantasy  
A doer sees a prophesy  
He clothes the thoughts in wood and steel,  
And makes the dream of fiction real.

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# The Sunlight Master

By E. J. VAN NAME

*If man appreciated what the Universe is, as far as we know it, he would live in a state of wonder. In our little Solar Orbit, which is a minute portion of the Universe, there is wonder enough to surpass our conceptions, and in this story one of the greatest of these wonders, the incredible waste of solar energy, plays its part.*

**S**PECTROSCOPY is an analytical study of the energy radiated by matter. There is a curious difference in the behavior of the two great physical entities, matter and energy. Matter has a natural tendency to condense: each material body attracts other bodies towards itself, and shrinks into the smallest possible space. If gravitation is the predominant force in the Universe, and if, at any one instant, all the matter in space were relatively at rest, the ultimate state of the physical world would be certain: there would be one single body of maximum density—the eternal, subjectless monarch of boundless space. It must be confessed, however, that there is great uncertainty about the postulates. Energy, on the other hand, is predestined to dissipation. There is no receptacle of energy—with the possibility of certain material atoms and their parts—in which there is no leak. In the ultimate conditions we have just imagined, the extra-atomic energy of the Universe would be diffused uniformly through space.”

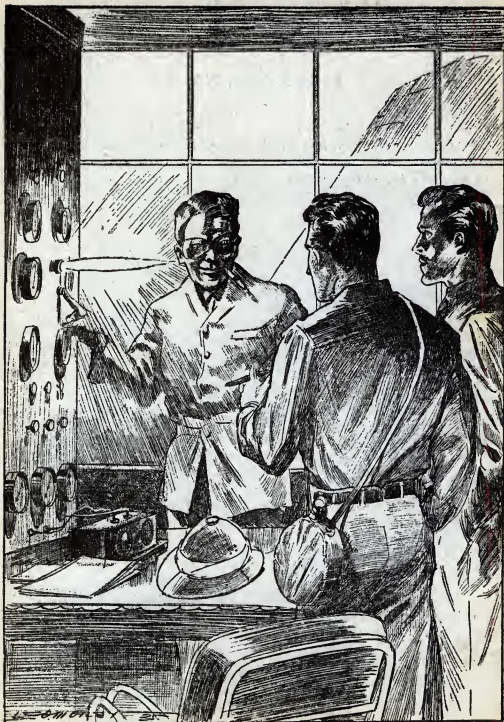
The smoke of two cigars, a pipe, and cigarette filled the long, book-lined library as Doctor Franz Gould concluded the paragraph in the large book

that lay in his lap and flicked the ashes from his cigarette into the open fireplace. From the streets below came no sound of London's evening traffic. The wavering firelight and the soft glow of the reading lamp at the Doctor's elbow cast a warm, mellow light upon the faces of the four men. Travers cleared his throat and his jaws took a fresh hold upon his half-smoked Perfecto. Renault's had gone out an hour ago after insufficient lighting had little more than scorched the tip. Young Freddie Townsend simply sat hunched forward in his chair, his chin resting in his hands, his smoking pipe clutched tightly between his even, white teeth, while his boyish face beamed with interest.

“By George!” he exclaimed as Doctor Gould laid the volume upon the library table. “Do you really believe there is anything in it?”

Doctor Franz Gould smiled mirthlessly as he answered: “Konrad thought so—that's why he's not here tonight—and we are.”

**B**UT—Great Scott, Franz!” It was Travers speaking now, the tall, well-moulded Englishman whose bronze face set better beneath the brim of a pith helmet than it did above the stiff-



*A brilliant flame, eight inches in length, shot out from the fixture.*



collar and dinner jacket. "What has all that stuff got to do with Konrad? You've been telling us about a strange place—you won't say where—and of a strange man who has mastered the sunlight. It's unbelievable!"

Doctor Franz Gould cleared his throat and absently stroked the point of his Van Dyke beard.

"Konrad read that paragraph to me three years ago," the Doctor replied. "It was just before he began to startle the scientific world with his amazing researches in spectroscopy. There is nothing new in that paragraph—but it sums up the whole subject in a devilish brief manner—that's what seemed to attract Konrad—and lead him on to greater things in his researches."

Freddie Townsend sucked his pipe vigorously until great clouds of smoke were swirling upwards toward the beamed ceiling.

"Tell us more about this man—this Max Konrad," suggested young Townsend. Renault and Travers nodded. Franz Gould crushed his cigarette upon the edge of an ash receiver. Then he turned his attention back to the group and spoke.

"Max Konrad was a graduate of Munich University. He was one of my most distinguished students during the two years I was connected with the University. His great interest was spectroscopy as you all know. There is no reason to detail young Konrad's life. It is sufficient to say that he made great strides in spectroscopic research, following his graduation from Munich University. That was some five years ago. I left the University at the time of Konrad's graduation and I did not see my former pupil for two years.

"Then one day I ran across him at Stanford University in California where I had gone to conduct a series of experiments. It seems that Konrad was

carrying on experiments at the University also and had been for some six months prior to my arrival there. The scientific world need not be told of Konrad's successful attempt to harness solar energy."

Travers nodded slowly as the Doctor paused.

"Yes," responded the Englishman. "I recall the intense excitement caused by the announcement of his accomplishment. But what became of him?"

"Ah!" The Doctor selected and lighted another cigarette. "That is what I am coming to.

"Three months after my chance meeting with Max Konrad at Stanford University the man dropped out of sight—completely. His disappearance caused great consternation in the scientific world. A thorough search of his personal effects revealed nothing—and incidentally, there was absolutely no suggestion of any of the experiments which he had been carrying on. His discovery had disappeared with him."

"But, Mon Dieu!" interposed Renault. "Could you not trace him—?"

Doctor Gould shook his head.

"We tried every known way," he replied. "There was neither hide nor hair of him to be found. Max Konrad disappeared—completely."

"And you can offer no suggestion why?" asked Townsend.

"Only one."

The three men waited with new interest the Doctor's pleasure.

"Do either of you gentlemen recall a number of accounts published in the newspapers which dwelt upon a controversy between the International Consolidated Oil Corporation and Max Konrad?"

"Yes," responded Travers immediately. "It began when President Robert Kaplin of the International Consolidated

published a statement to the effect that Konrad's discovery was a hoax, so to speak. A bid for false glory—"

"Exactly."

"—And Konrad came right back—"

"—exactly as a hot-headed Prussian would," interposed Franz Gould.

"Exactly as a hot-headed Prussian would," repeated Travers, "and predicted that International and all the rest of the 'commercial hogs', as he put it would be bankrupt within sixty days after his discovery had been applied to public utilities."

"Just so," agreed Gould. "Your memory is excellent. Go on—what followed?"

Travers smiled wryly.

"I guess we all know what followed," replied the Englishman. "The powers blocked Max Konrad so that he was helpless. Could get absolutely no backing. They blocked his patents through the Federal Government and tried to buy his discoveries at a ridiculously low price."

"Yes," concluded Doctor Gould. "And six months later Max Konrad disappeared from the face of the earth—completely vanished—and took his findings with him!"

"And science and Robert Kaplin have searched unceasingly and unsuccessfully for him for the past two and a half years," put in Renault.

Doctor Franz Gould inhaled deeply the smoke of his cigarette.

"Science and Robert Kaplin have searched unceasingly and unsuccessfully for him," he repeated. "But," added the Doctor after a moment's reflection, "my own search has borne fruit."

"What?" "Your search?" came from two of the company.

"You know where Max Konrad is?" demanded Freddie Townsend. "Then why in thunder, man—"

Doctor Gould had raised his hand for

silence. And he was wagging his head from side to side.

"NO," he answered. "I do not know the whereabouts of Max Konrad. I did succeed, however, in trailing Konrad for a considerable distance. I finally lost his track."

"Where?" Renault's question was tense, a half whisper.

Doctor Franz Gould's answer was deliberate, the words measured.

"Africa. Mombasa. Tanganyika Territory."

"Africa!"

"Good Lord, man!" cried Travers. "What in God's name was Konrad doing out there—out on the edge of the African wilderness?"

"I can think of but one reason," responded Doctor Gould.

"And that?"

"Konrad's greatest ambition was to solve the secret of extracting energy from solar radiations. He accomplished it. He then turned to the world with his discovery—a discovery that would free the world from age-old shackles. It solved the problem of our diminishing fuel supplies—it gave the world unlimited energy, power, freedom. The only expense was to build the machines necessary for extracting this power. And what did Konrad receive for his offer? The promise that he would not be allowed to interfere with the material gains of those who already need no more in the way of worldly goods!"

"You mean that Konrad has turned his back upon the world for good?" asked Freddie Townsend. "You mean that he will conceal—perhaps destroy—his invention?"

"I did half believe that he might—at first," replied the Doctor. "But now —" he reached for a newspaper that lay half crumpled upon the library table. "You gentlemen have not seen

this, the latest edition of the 'Times'?"

"I glanced over it," replied Renault. "I saw nothing that seemed unusual to me."

"Doubtless not," returned Doctor Franz Gould. "Nor is what I am about to call to your attention going to appear as unusual." He turned a page and folded the paper. Turning to an inconspicuous dispatch in the lower corner, he held it so the light of the reading lamp fell upon it. The Doctor read:

**"DEVIL'S ISLAND, January 3rd.**

The ten prisoners who escaped from here last week are still at large. Every effort is being made to effect an early capture.'"

There was a brief pause as the Doctor finished reading and laid the paper back upon the table.

"Well?" inquired Freddie Townsend.

"There is more to the escape from Devil's Island than has been given out to the public," went on the Doctor. "I have a very good friend—a physician—who is employed there by the French Government, as a prison doctor. I received a letter from him only this morning." Franz Gould drew an envelope from his pocket. From it he extracted and unfolded a single sheet of paper.

"My dear Franz:

"I doubt greatly if you have noticed the news dispatches relating to the escape of a number of prisoners from this colony. The dispatches were, I understand, of the ordinary, inconspicuous type such as we usually find relating the lesser news of the day.

"I assure you, my dear Franz, that there is more—much more—to the story. If my mail were censored, I should not be able to write these lines. So I must ask you not to repeat them, or only to the most reliable, of which there are extremely few.

"On the night of the escape I was

in my quarters and was not aware that there was anything wrong until I heard scattered shots. Then I learned that a giant airplane had come silently to rest upon the waters of the bay and a man had crept stealthily ashore. Without a sound he had slain three guards and released ten prisoners from their cells.

"The significance of the whole affair is that the men who died literally had their hearts scorched out and that the men released were all persons of first rate intellect. Among them were four physicians, two scientists and four men of good education and excellent physical build. The strange deliverer supplied each man with one of his deadly hand weapons and before the surprised guards were aware of what had taken place, the airplane had skimmed across the harbor and leaped into the air and was gone.

"I know this is a strange account but I swear it is the truth. Explain it, I cannot. Perhaps you, my friend, can offer some explanation.

"With kindest regards, I remain,

"Yours,

"Anton LeBrix."

**"THE Devil!"** ejaculated Travers. "Where is all this getting us to?"

"I'm not certain," replied Doctor Gould. "But what I asked you men to meet me here for is this: You are all interested in some branch of science. You, Travers, as a collector. You, Renault, in geology. Townsend is something of a botanist. I am a Doctor of Physics. We all four of us love adventure. We have been friends for some time. We all have something in common. From a native in Mombasa I learned that there was something to the east of Tanganyika Territory—an area—feared by the natives. I don't know why. But I understand that the

natives will not go near this portion of the country. I don't know what this affair at Devil's Island has to do with the spirit-infested country in Equatorial Africa—if anything. But there is one thing I would like to do. And I shall need assistance. Will you men undertake with me one last search for Max Konrad?"

The silence that followed Doctor Gould's proposition did not long endure. Travers thrust a hand forward almost immediately.

"Count me in," he replied briefly.

"And me," spoke Renault.

Freddie Townsend puffed great clouds of rank smoke from his pipe.

"I'll tail along," he said presently.

## CHAPTER II

THE first day of February found the four men entering Kilindini Harbor, Mombasa. Across the dangerous reefs lay the palm-fringed coast of Equatorial Africa. About the ship swam shoals of alert sharks, their sharp dorsal fins cutting the oily surface of the harbor. The red western sun cast long shafts of orange and golden sunlight across the grey boles of giant baobabs and the white-walled red-roofed houses of the Island Town. A fleet of dhows with their sharp-visaged Arab sailors swarmed about the ship, offering Oriental wares and transportation to the quay. On shore the flag of the Customs Shed sagged on its halyards. But by the time the ship's anchor had slipped lazily to the mud of the harbor's bottom, the sun had dropped into the west and the Customs Shed had finished its business for the day.

On the following morning Doctor Franz Gould led his three companions to the babel of the Customs Shed. After a prompt and courteous clearing, a two mile automobile ride took them across

the sweltering island to the town of Mombasa. Within a very short period of time the four found themselves residing at the Manor House, under whose lofty ceilings, with the cement floor and coral walls, they found respite from the heat. After a cool lunch, they were prepared to discuss their next move in the search for Max Konrad.

"It was here, just one year ago, that I learned about the devil-infested country from a native," Doctor Gould informed his three companions. "This native boy had accompanied Konrad on a hunting expedition over toward Lake Manyara. He was mauled by a lion during a hunt and had to be returned to Mombasa for medical treatment. And that is the last information that I have been able to procure in regard to Max Konrad."

"Then you propose to push on toward Lake Manyara and search for him?" asked Renault.

"No. First I shall endeavor to locate the native boy of whom I speak. It is possible the fellow may know more about Konrad and his party by now."

Doctor Gould went out an hour before sunset to search for the black boy. Renault, Travers and Townsend idled away their time by making a tour of the town.

Two hours later the three men were back in their rooms at the Manor House. This time it was to face a grim faced Doctor Gould who had anxiously awaited their return.

"ANY news?" It was Travers' question as he flung his hat upon the table.

The Doctor nodded.

"Some."

"No!"

Franz Gould nodded slowly.

"You found the native you spoke of?" inquired Townsend.

"Yes, I found him."

"Good!" approved Renault. "We'll have a good guide, at least."

"We may, if I can induce the fellow to come along. But it will take a bit of inducement, I can tell you."

"What do you mean?" Renault had stepped forward.

"Sit down," invited Doctor Gould, himself sinking wearily into a chair. His companions complied, anxious to hear his story.

"I found Mwanika—that is the name of the boy I referred to—and he was greatly surprised to see me. I immediately asked him if he had heard anything from Max Konrad's party, but he reported that they had never been heard of again. When I attempted to get him to guide us over toward the crater country north of Lake Manyara in a search for Konrad he became very reluctant to do so. He at length expressed his opinion that the Ngorongoro devils had gotten Konrad and his entire party."

"The what?"

"The Ngorongoro devils—never heard of them before. But it seems, according to Mwanika, that the Plateau of the Giant Craters, which lies to the north of Lakes Manyara and Eyassi, have within the past two years become a place of terror to the natives. Ngorongoro crater is the center of it—"

"Of what?" queried Townsend.

"Of strange lights of many colors and fires that spring from the earth without warning, in any place from the crater's rim to the strange hive-like kraals that are clustered upon the southern shore of Lake Magad which lies in the bottom of the crater!"

IT took much persuasion on the part of Doctor Gould to induce the superstitious Mwanika to finally agree to accompany the party. The Doctor, by

keeping the actual objective of their trip a secret, managed to secure fifty other porters. They struck due west, across the veldt country through Tanganyika Territory.

There came days of toilsome trek. The caravan crossed the arid Sanya Plain in open view of the snow crowned Kilimanjaro on the north and the towering Kibo Summit. The way was a gradual ascent finally emerging on the rich highlands of Meru Mountain in Arusha.

From Arusha the party pushed westward and for three days trekked across the usually parched steppes. Water was plentiful at that time of the year, due to heavy rains that were encountered, and there was much mud to be waded through. Game was abundant and the party was always able to secure fresh meat. Of game birds, too, there were many.

On the fourth day the caravan reached the Mbujuni River which, rising in the Esimangor Mountains, flows southward\*. From here the party skirted round Esimangor, marched south along the shore of Lake Manyara and at length came upon a Masai encampment. At this stage of the journey the only available water lay in a muddy depression on the Manyara flats, and this water had been churned up by the hoofs of zebra and cattle. Travers, Renault and Townsend thought it strange to see the zebra browsing about near the encampment. But Doctor Gould explained that the Masai never kill and eat the game about them. Consequently the latter had no reason to fear man. It is probable that the game looked upon the humans as a form of protection from the numerous lions that inhabited the vicinity.

As camp was pitched upon the grassy flats of Lake Manyara, the travelers

\* Through error, it is shown to flow north at this point on the Kilimanjaro Section map, B-5.



obtained their first uninterrupted view of the East African Rift Valley and the great wall on the far side, running north and south across the landscape. It seemed then to bar the path of further progress while to the right towered the lofty summit of Loolmalasin,\* the highest peak on the plateau. Some fifty miles to the north, along the western wall of the Rift Valley and standing out in dark contrast against the skyline, loomed the Oldonyo-lengai volcano. To the south across the thin, silver streak of Lake Manyara, there jutted the steep buttresses that round off the Iraku portion of the plateau and which are known as the Wambulu country.

As the caravan stood there, their eyes sweeping the magnificent panorama before them, the natives raised their arms and pointed toward the distant escarpment.

"Engotiek!" they exclaimed in tones of awe. "Engotiek\*\*!"

Whereupon they informed the white men that their trail had ended—that before them lay the boundaries of the Devil's country. They dared not penetrate the Mountain of Fire. Doctor Gould argued. It was of no avail. Travers suggested forcing the blacks to carry their equipment at the point of a gun. But Doctor Gould would not have it.

"NO," he said. "If they will not go further of their own free will, we must accept the inevitable. We will make a permanent camp here and I will go over to the Masai camp and see if I can find other porters. Otherwise we must pack on our backs what equipment we find necessary and conduct our ex-

plorations of the craters from this point."

Doctor Gould's trip to the Masai encampment below proved fruitless. There were none of the tribe who would cross that escarpment to the Devil mountain of Ngorongoro. Doctor Gould accordingly dismissed all but five of the porters, the latter of whom were retained to maintain the camp while the white men explored the crater country.

Then there arose the question as to who would stay in camp with the natives and who would go forward. Lots were drawn. To Renault and Travers fell the lot of camp duty. Doctor Gould and Freddie Townsend were to go forward.

The pink sunrise of a new day had barely begun to disperse the curtain of night when Doctor Gould and Freddie Townsend shook hands with Renault and Travers and trekked off into the wilderness. Even though they must carry their own packs, there was a degree of relief in leaving the intolerable cloud of flies that hovered about the filthy water hole.

The Doctor took the lead and struck out around the north end of Lake Manyara to the Dathiyeni River whose waters ran cool and clear between forest-clad banks. The first part of their journey took them across a long stretch of sage-covered plain interspersed with belts of thorn scrub. Later, upon nearing the ancient shore line of the lake, they trekked across that curious petrified mud formation which resembles nothing so much as gigantic cobblestones, walking across whose surface becomes an arduous task. Flocks of flamingoes could be seen feeding far out in the shallow lake making a great splash of rosy reflection as they fed.

Camp was made that night on the bank of the Dathiyeni River which ran tumbling and brawling along the base

\* The Hettner Summit (11,856 ft.) the highest point of the plateau and known to the Masai as "Loolmalasin."

\*\* The name commonly used among the natives for the Highlands of the Great Craters.

of sheer cliffs rising almost perpendicularly for two thousand feet. Doctor Gould announced that his aneroid stood at 3,150 feet above sea level.

The two men were off again at dawn, winding their toilsome way up the face of the escarpment. The sun was well up in the sky, when at length they stood together upon the summit and looked out across the Rift Valley. It was plain that the Valley was divided into a chain of basins of varying dimensions and formed of porous volcanic débris. A number of these basins were so shallow that one could scarcely understand how they could hold water under the torrid rays of the equatorial sun. Far below, from the face of the escarpment, plunged a subterranean river whose waters ran but a short distance only to become lost again in some lake bed or crater midst the primeval forest surrounding it.

A TREK of seven hours took the two explorers across lands practically identical with the Tanganyika-Nyassa Plateau. Then came a gradual ascent to an undulating grass country occupied by scattered thorn trees and running finally to a sharply defined belt of primeval forest.

"Two days more," Doctor Gould told his companion. "Then we shall look upon this Devil mountain—this heretofore perfectly harmless extinct crater—Ngorongoro."

Camp was made that night in a green glade at an elevation of fifty-eight hundred feet. The forest dew was heavy and by morning the camp was drenched. After a hasty breakfast the two men moved gladly from the forest belt and into the open glades beyond.

The season was between the "big and little rains," as they are called. The flowers of both plants and trees were in full bloom. The forest bordered narrow glades like hedges and was bril-

liantly hung with a species of yellow-flowered aborescent bean. Great bunches of purple veronia blooms formed a striking contrast to the yellow-white, wonderful carpets of lilies; forget-me-nots, scabiosus and everlasting flowers grew in between the greens of fennels and wild turnip. Lower still, from the delicate grasses and clovers, long-stemmed violets held their dainty heads erect.

That day Doctor Gould and Freddie Townsend crossed the topmost plateau of the fascinating country and leaving the forest and its glades, looked downward from an elevation of nearly eight thousand feet upon a treeless moorland. The steep slopes of the Loolmalasin Summit and Olomoti Crater and their connecting ridge bounded the moor on the north and west. On the south and east a ring of connected hills and ridges gave resemblance to a long-dead volcano.

That night they camped amid the tumble of hills. Game had become conspicuously absent during the march from the camp on Lake Manyara, but now the party encountered an occasional rhinoceros.

Another day found Franz Gould and Freddie Townsend encamped out on the moorland. On the morrow they would at last reach the Ngorongoro Crater! The Devil mountain! What would it reveal to them? What was it that had so frightened the natives whose ancestors had for centuries before them plodded the craters with complete indifference? Only the morrow could tell.

Camp was astir early next morning. A cold mist was driving past, but little attention was paid it. The anxiety of the explorers to reach their objectives made them careless of discomfort.

There was a two-hour trek yet ahead of them across the moorland, near the center of which their camp lay. But in the shortest possible time breakfast was

eaten, camp was struck, and the travelers were on their way.

Steadily they marched across the tussocky turf, crossing one sizable stream which straggled through the center of the moor. To their right front loomed the immense and frowning volcanic pile of the Olomoti Crater. Halfway up its ramparts a narrow breach was visible from which, Doctor Gould said, poured the Lemunge River whose source was high up in the springs of the crater. The stream, he explained, emptied into Lake Magad which lay in the Ngongoro Crater some four thousand feet below its source.

The party reached the turbulent stream about halfway down its length where it left the edge of the moorland and plunged across the wall of cliffs. Crossing the river at this point they left the moorland behind them and entered broken country. A blackened and matted old acacia forest added to the desolation of the place, although the floor of the forest was considerably brightened by an extraordinary wealth of flowers and flowering shrubs. In a few minutes the two men had completed the climb and had passed through the last belt of forest.

**"LOOK!"** Doctor Franz Gould said, as he extended an arm.

Before them lay a vast and mighty chasm, whose sudden revelation seemed to take the breath from the man who looked upon it for the first time. An unbroken ring of hills circled away on either hand to meet again in the blue curtain of haze twelve miles beyond the traveler's point of observation. Much of the hills were clad in forest and green with grass. But they had at some remote age held within their walls as vast a cauldron of bubbling lava as the world has ever known. On the far side of the extensive crater floor lay Lake

Magad while over the shallow sheet of water towered another great crater—Oldeani—her shadow falling on the blue waters and gleaming marshes and mud flats. A fitting monument to guard the place where the forces, that had raised her, had at last gone to rest.

Nor was that all. Far, far down, on the right hand, lying on the southern shores of Magad Lake, appeared some sort of a settlement. Doctor Gould examined it for a long time through powerful binoculars.

"It seems to be a group of hive-shaped kraals," he announced at length. "Off across the lake there seems to be some sort of a framework. There are four others distributed at different points in the crater; under Olomoti, Oldeani and along the lake."

"So far we haven't seen the devil snort any of his fire," ventured Townsend.

"No," replied Doctor Gould. "But we will go slow. Those habitations are certainly not native kraals."

The two men spent the remainder of the day laying plans for exploration. That night they camped in a grove of euphorbia trees near the crater's floor and discussed their plans until after midnight. Just at dusk, lights had appeared at the settlement in the crater and also at the various outposts that had been observed at different points within the crater. Occasional weird flames would pierce the night at these points and it was not long before Townsend ventured the remark: "No wonder the Masai think the devil hangs out here. I'm beginning to think so myself." To which Doctor Gould nodded a grave affirmative.

Before dawn had tinted the eastern sky, Doctor Gould and Freddie Townsend were astir. They breakfasted, then decided to make their present camp-site permanent and work cautiously

down toward the hive-shaped kraals in the crater near the lake.

"The crater abounds with game," the Doctor told Townsend. "We can lay in a supply if needs be. Just at present we'll save our shots and not attract the attention of yonder settlement. Now, let us be on our way." He arose.

"Up with the hands, gentlemen!"

The two men whirled.

"You are surrounded!"

A group of men, faces completely masked, closed in upon Doctor Gould and Freddie Townsend.

### CHAPTER III

**D**OWN the side of the valley of brooding mystery the mysterious strangers led their two prisoners. There were ten members in the party that had so completely surprised Doctor Gould and Freddie Townsend. And all were white men, of evident high intellect and culture.

Presently they crossed the Lemunge River and paused for a short rest on the short clover-sprinkled crater bottom. Now they were in the midst of the abundant game of which Doctor Gould had spoken. Thousands of zebras with bristling manes stood and snorted, pranced, danced or galloped about; uncountable blue wildebeaste swarmed over the flats. Kongoni hartebeaste and Thompson's gazelle, too, were much in evidence.

After a short pause, the man who seemed to be the leader of the group called for a resumption of the march. Mid-morning found the party entering the village of hive-shaped kraals on the edge of Lake Magad and which Doctor Gould and Freddie Townsend had observed from the crater's rim.

Now the same man who had led the ten, ordered the two prisoners taken to a room in a large building where he

followed them. He motioned his own men to withdraw and invited his "guests" to be seated.

"Well, gentlemen. To what am I indebted for this visit?" he began with strong Teutonic accent.

Freddie Townsend leaped to his feet.

"Max Konrad!" he cried.

"Sit down!" commanded Doctor Gould.

A short, mirthless laugh came from behind the mask.

"I do not believe that I have ever met your friend, Doctor," said the man, turning to Gould. "Though he seems to know me."

Doctor Gould mumbled an introduction.

"And now," went on the masked man. "Why have you sought me out?"

"We have come," returned Doctor Gould, "to find your whereabouts, Max Konrad, and your reason for not returning to the civilized world . . . the world of science . . . where you belong."

Konrad carefully observed the men who anxiously awaited his answer.

"**S**O you came to urge me to return to civilization—to the world of science—as you call it?" His voice was bitter and the eyes behind the mask were brooding. "Well, let me tell you here and now—I shall *never* return."

"But Konrad . . . !" Doctor Gould had risen.

"Sit down!" It was Konrad's turn to command as he slightly elevated his voice. "You were a good friend of mine, Doctor," he went on. "A very good friend. You may thank that for your being alive at this moment. Your friend, also. To you I shall go to the trouble of explaining at length my reasons for being here."

"We are aware of what occurred between you and Kaplin," Doctor Gould

informed him. "But why allow one man to ruin everything for you?"

Konrad's dark eyes scowled.

"You know that the entire pack was against me," he growled. "You know that they were blocking me everywhere I turned."

Doctor Gould said nothing.

"What's the idea of the mask?" asked Freddie.

"I have my own reasons for that," Konrad returned coldly. He turned back to the Doctor Gould. "I said that I would explain my reasons for being here.

"It has long been known that one of the most important characteristics of the sun is its practice of radiating energy," he stated. "To me it has been for years an engrossing study. I have studied the subject closely, the discharge of light and heat from the orb, and have conducted exhaustive researches into the 'habits' and properties of ethereal vibrations. While it is true that the sun's attendant planets and their satellites receive but one part in 120 million of the solar radiation, yet when one considers the rate of discharge from the sun, he can readily realize what a tremendous amount of radiation even the 120th million part contains."

He paused and drew open a drawer in the desk before him. From it he lifted a box of cigars which he held out to the men before him. Townsend and Doctor Gould each selected a perfect one and nodded their thanks.

Rising, Konrad stepped over to a jet-like wall fixture, chin-high from the floor.

"My cigar lighter," he stated, pressing his finger upon a button on one side of the fixture. A brilliant flame, eight inches in length, shot out from the fixture. In a half trance, Townsend and Doctor Gould stepped up and lighted their cigars. And as they resumed their

seats in a blue wreath of tobacco smoke, Konrad's eyes were twinkling through his mask.

"Just one of the minor conveniences of Solaropolis," he explained blandly.

"SOLAROPOLIS!" broke out Freddie Townsend. "Good Heavens, Konrad! What is this, anyway? Why keep us in suspense? What are you doing out here in this Godforsaken wilderness?"

The dark eyes smiled again. The man resumed his seat leisurely.

"Mr. Townsend," said Max Konrad. "The rate of radiation from the sun corresponds to a loss of something over four million tons per second. An enormous loss, my friend. An enormous waste. What you have just witnessed was but a demonstration of one of my numerous methods of reclaiming a small percentage—oh, a very small percentage—of this lost energy."

"By the Gods of Olympus!" cried Doctor Gould. "I had already guessed as much! But why come away out here and waste it all in this devilish wilderness?"

The man's eyes had hardened as he regarded the Doctor.

"Waste it?" The eyes seemed brooding for a moment. "You would rather I would waste it upon an unappreciating civilization, is that it? Rather I would allow my good friend, Robert Kaplin, to steal my discoveries, so that his brood of hogs could further rob the people!" He laughed contemptuously. "Well, I will remain here in the wilderness and give those the benefits of my discoveries who appreciate them. I have everything I desire here; power, heat, machinery, agriculture . . . everything!"

He paused and peered intently at his "guests."

"But come," continued Konrad. "I will give you a better view of what I



have accomplished in my "Solaropolis."

They followed the man from the chamber and out into a shaded street. They crossed the thoroughfare and presently found themselves in another building. Konrad led them down a long flight of stairs, at the foot of which they discovered themselves upon a platform some ten feet above one end of a long, high-ceilinged room. Men were at work here—white men, all masked, fifty, perhaps, over a maze of machinery that smacked of the scientific laboratory. The room was crowded with strange looking apparatus. There were batteries and electric coils, delicate scales and balances, rows of ivory buttons and copper switches, elements, test tubes set in racks, rows of glowing vacuum tubes and strange and mysterious charts plastered upon the tables and walls. But most of all there were mirrors; small mirrors, plane mirrors, concave and convex mirrors, spherical mirrors, lenses and prisms. There appeared to be endless beams of light, some brilliant to the point of terrific concentration, some dim, some bright, yet all safely confined within the limits of the apparatus.

From the platform ran a cat walk out over the machinery to the center of the room. There a circular metal tube some ten feet in diameter ran from the floor to the high ceiling. A closed door appeared in the metal tube at the end of the cat walk across the room and from which the walk continued as a metal stairway, which spiraled upward about the tube, and disappeared through a small black hole in the ceiling.

Max Konrad motioned the two men to follow him. He crossed the metal cat walk and ascended the circular stairway. Doctor Gould and Freddie Townsend followed in close order. Passing through the opening in the ceiling they found themselves still on the metal stairway which was now ascending

through a dimly lighted passage. Presently the man in the lead reached a small platform and threw open a portal before him. Passing through this, Konrad led his "guests" into a small pent house or observation tower.

From the windows of this tower Doctor Gould and Freddie Townsend could look out over the settlement. There were few buildings over one story. In fact, there were few buildings in the entire settlement, which barely covered two acres. On a near by building Freddie noticed a pair of radio towers and concluded immediately that Max Konrad kept in touch with the outside world, whether or not he had forsaken mankind. There were cultivated fields, too, in which the Doctor and his young companion could see men working, all masked, all white men. Not a native could be seen in the entire place. Was this not the home of the Devil? Townsend smiled to himself. If not the Devil then surely the master of the sun's fire.

"THOSE strange contrivances over there near the lake?" asked Doctor Gould. "What are they, if I may be so bold as to ask?"

"Certainly. That is my source of power. My source of energy, so to speak. The energy is intercepted and concentrated out there and then transmitted through a series of prisms to the plant below. There it is concentrated to an even greater degree after which it is distributed as I desire. While I could maintain a concentrating plant right here, it is more desirable to place a number of plants at different points in the crater. Thus I am able to concentrate a much greater amount of energy than I could possibly hope for in one collecting point."

"But surely, it must take enormous concentration to obtain enough power for the needs of a settlement—electric

lights, as I have noticed you have; heaters and various other uses."

"True. It does. But it all resolves into a problem of concentrating the sun's radiation into heat and electricity. There is much of the sun's radiation which is absorbed by the earth's atmosphere—but that problem I have also solved. I had to—after I came here. The sun does not always shine. And when it does not I must fall back upon my extraction principle. Then too, I store much of the energy obtained in clear weather in my solarite batteries, just another of my methods of making use of the resources made available to us by science and nature."

"But how do you ever manage to concentrate your energy enough to make use of it?" Townsend wanted to know. "There is a great amount of the sun's energy spent on the surface of the globe, it is true. But in one small portion—"

"Yes," agreed Konrad. "Natural limitations make it difficult for us to measure the exact amount of radiation received. We have always been able, however, to measure the amount of energy received by a small portion of the earth's surface. After allowance has been made for absorption by the earth's atmosphere, the estimate is usually expressed as the solar constant. This is defined as the amount of energy which would fall perpendicularly per square centimeter per minute on a surface placed just outside the earth's atmosphere. This constant has been determined as being about 1.94 calories or 81 million ergs. It is, of course, subject to slight variations which are due to periodic sun spots\* and other factors."

"Being able to extract the lost energy or radiation from the atmosphere, I can combine both my methods and receive the same amount of radiation as I would

receive were my concentrators placed just outside the earth's atmosphere."

"But your gardens . . . your agriculture?" pondered Doctor Gould. "I believe that you said something about assisting your crops with your discoveries. You mean that you control the temperatures?"

"NO. That is a difficult phase of spectroscopy. A complete isolation of the various wave-lengths contained within the sun's spectrum has enabled me to materially increase my crops. For a certain period each day the crops are under the wave-lengths best suited for their growth. The same is done for my people. Each man is required to sleep for a certain number of hours each day. While he sleeps he is given the benefit of health-giving wave-lengths. As a result you doubtless noticed the physical fitness of my people."

Doctor Gould nodded gravely.

"I did. And by the way, Konrad. Where do these white men come from?" Konrad frowned.

"I never ask them," he replied tersely. "So long as they do their duties faithfully I ask them no questions."

The Doctor sighed.

"If you would only come back with us," he said. "I am sure that all could be arranged to your complete satisfaction."

"No!" The easy demeanor of the man had fled. No longer was he the scientist enthusiastically explaining his latest discoveries. He was but the ruthless avenger that had greeted Doctor Gould and Freddie Townsend that morning under the euphorbias. "No! Never! I have been bitten once. That is enough!"

The Doctor eyed Max Konrad critically.

"Know anything about the Devil's

\* It is interesting to note that the rate of radiation increases with the appearance of sun spots.

Island prison-break, Konrad?"

"Eh . . . ? What?"

"Nothing. You are something of an idiot, Konrad. You are lord here in your little realm. But outside of that you'd better be careful what you do. Your great discoveries have gone to your head. Be careful. They will avail you nothing in the end. You will be discovered and crushed. You will spend the better portion of your life in prison!"

Konrad's face had assumed a steely smile. He spoke no word as he turned to a row of ivory buttons and switches on one wall of the pent house.

"LOOK!"

His arm swept toward the crater's rim. Suddenly a brilliant flame leaped into the air; ten, twenty, thirty, forty feet! It disappeared. At another point upon the rim the same brilliant flame licked skyward. A third; a fourth. Konrad turned to his wide-eyed "guests."

"If the world can penetrate the power of the sun," he said icily, "let it do so. I have three lines of defense within the crater besides the one on the rim. The walls of the settlement are also protected."

"Yes," chimed in Freddie Townsend. "And just about one good aerial bomb will make a monkey out of you!"

Konrad laughed disdainfully.

"I can throw a solid network of aerial defense beams over the settlement that will explode aircraft bombs while yet two thousand feet in the air!"

Doctor Franz Gould shook his head slowly and sadly.

"I am pained," he said. "All this can come to no good ending. There is nothing for us to do but retire."

Konrad turned again upon them, this time with a harsh laugh.

"Yes," he replied. "Since you disagree with me. Gould, you shall retire

to power station number one. And you, my impulsive young friend," turning to Townsend, "shall assist in the installation of my new power line across the crater!"

## CHAPTER IV

A WEEK under the torrid sun on the bottom lands of Ngorongoro Crater had wrought a change in Freddie Townsend. He was one of a crew of five men engaged in erecting a low causeway upon which was later to be installed by the scientific minds of Solaropolis, a solar radiation transmission tube from a new plant at the foot of Olomoti to the power chamber of Solaropolis.

His companions were white men. They were bossed by a short, heavy-set Frenchman named Rogers. Where Rogers came from Townsend had no idea. There was little time for talk among the crew. It was all work.

During his entire week Townsend had had no opportunity to visit Solaropolis. He was kept in camp on the causeway with his fellow workmen. Nor had anyone been out from the main settlement which was some five miles distant around Lake Magad. Thus Townsend had had no opportunity of ascertaining the whereabouts of Doctor Gould. But the young man rather believed that Max Konrad would endeavor to put him to work on some of the scientific problems of Solaropolis. Doctor Gould would be a valuable addition to the crater city. Townsend resolved to do something.

On the seventh morning of his stay in the construction camp, Townsend saw a large amphibian airplane of the passenger type quietly approach the settlement across the lake and quickly settle upon a smooth stretch of beach between the buildings and the lake. Although the settlement lay five miles across the

crater, the air was clear and Townsend's eyes were sharp.

"SO that's the way Konrad pulled his trick at Devil's Island?" he mused aloud.

Rogers, working near, straightened up quickly.

"How you know dat, m'sieu?" he demanded.

Freddie smiled. He had guessed rightly. He must play Rogers for what he was worth.

"Easy. The papers said an airplane was used. I never could figure where it could have come from. With the question of fuel eliminated, it could have come from almost anywhere. But I guess it didn't."

"What you mean?" was the tense question.

"I mean that Max Konrad had applied his principle of extracting energy from matter to the motors of that craft. Where he got the thing in the first place I can also guess. The United-African Airlines had a ship turn up missing not so many weeks ago. If I'm not mistaken, Max Konrad had something to do with that. Yes, he must have. As I recollect, their East-West Coast Belgian Congo line passed not so far south of this place."

The Frenchman turned to Townsend after a moment of silence.

"Better you not know dat, m'sieu," he observed at length.

"Why?"

"Da Master, he likely kill you."

"The Master, eh? So Konrad's the 'Master' around here, eh? The master of what?"

"Da Sunlight Master."

"The Sunlight Master! Well, well, well! But he won't kill me, never fear. He doesn't dare kill people."

Rogers looked at Townsend significantly.

"You think no? You wait."

Townsend said no more. In his brain he was marvelling over Max Konrad's exploit. Doubtless he had flown from his lair in Ngorongoro across the southwest reaches of the North African deserts to Devil's Island, taken his prisoners, and coolly flown back to Ngorongoro. Nor was that all there was to it. Those prisoners had been carefully selected beforehand. There was no bungling; no indecision. It had all been run off like clockwork. So that was the way Konrad intended to tenant his Solaropolis. Amazing! He had flown three thousand odd miles with comparative ease, probably without a stop. He had returned efficiently the same distance. No fuel worries! The elimination of one of aviation's greatest problems.

Townsend knew that he would be unable to persuade the Frenchman or any of the others to join him in an attempt to overthrow Konrad. He was their deliverer; their protector. To return to civilization to them meant to return to prison.

But Townsend had no desire to remain in the shackles of Konrad for the remainder of the life of Solaropolis. And he knew that Doctor Gould felt likewise. He also knew that after a certain length of time Renault and Travers would push on in their tracks and endeavor to discover why he and the Doctor had not returned to the camp on the edge of Lake Manyara. And Townsend knew that if they were not soon warned they would stumble into the same trap that had caught himself and the Doctor.

THAT night, as the others lay sleeping, Townsend crept cautiously from his blankets and slipped away from camp. There was no guard maintained for there seemed little chance

that a man, unarmed and without provisions, would attempt an escape from the crater. The chances of a single person negotiating the crater's rim and the leagues of forest and veldt country, in order to reach civilization, would be remote, indeed.

Nor did Freddie Townsend attempt to leave the crater. Instead, he turned his steps in the direction of Magad Lake which he began to skirt in order to reach the main settlement of Solaropolis.

It was not long before sunrise when he came to the hive-shaped kraals. He had no definite plan in mind as he crept cautiously forward, but somehow Freddie Townsend hoped to conquer the Master and his settlement.

The radio towers looming into the night sky reminded Freddie that the Master kept in touch with the outside world and even then he wondered if Konrad possessed a wireless sending set as well as a receiver. He crept cautiously toward the building.

In the intense quiet of early morning Freddie found himself at length standing in the shadowed doorway of the radio building. He cautiously tried the door and found it to be unlocked. He was not surprised. Little use to keep the place all locked up. The crater's rim was doubtless the locality of the heaviest watch.

Once inside the building Townsend found himself in complete darkness. He felt carefully along the wall and at length came to a stairway leading upward. Now he could see a dim light filtering down the passage and as he placed his foot upon the first step a rasping sound came from above.

"Zutt—zutt—zzzzzz—uut!"

A. wireless!

Townsend's heart was thumping wildly as he went up the stairs one cautious step at a time. When he reached

the top of the flight he discovered a light streaming from an open doorway at the end of a short hall. Flattening his back against the wall, Freddie crept cautiously toward the light.

"ZUTT—zutt-zutt—zzzzuuuutt!" The operator was pounding out a message with vigor. Freddie listened intently. He could make nothing of it. It was in code. Freddie swore under his breath.

Ever so cautiously he peered around the corner of the open doorway. The man was sitting before his apparatus, his back to the door. Freddie was about to enter when he halted. No. It would be better to wait until the message was finished. If it broke off suddenly, no telling whom it would bring down upon the radio room. He would wait.

Suddenly a light footfall sounded at the foot of the stairs. Freddie stiffened. The man was coming up, cautiously, as if the maker was endeavoring to advance with no noise. Freddie debated but an instant. Whoever it might be, it would prove foe to him. There was left but one issue. He turned and tiptoed noiselessly into the radio room. While the operator still sat pounding out his message, Freddie Townsend quietly closed the door behind him and locked it by pressing a special lock-button of Konrad's own. But Townsend had noticed Konrad do this on his first day in Solaropolis, as the Master closed and locked doors behind him and Doctor Gould, as they were shown about the Settlement. And at the snap of the lock the radio operator turned.

He reached for a phone just as Freddie Townsend leaped through the air and circled one arm around his neck. His chair went over backwards and the man slid down to the floor; Townsend on top of him. The phone came with him. But Freddie had all the advantage.



As the operator struck the floor he dropped the phone and Freddie quickly grasped it. He tore it loose and brought it down with a resounding whack upon the skull of the bewildered radio operator. And that gentleman immediately ceased to have any further interest in the march of events, that was taking place in his chamber.

Freddie Townsend immediately turned his attention to the wireless. Quickly his eyes ran over the set. Then his hands were busy adjusting for the work he was about to do. Presently he crouched over the key and his fingers began to move.

"ZZuutt—zut—zut—," steadily he reeled off his message. A knock at the door. Freddie Townsend did not move.

"Open up!" It was the voice of the Master!

Freddie Townsend did not reply. Steadily he pounded the wireless key. A terrific crash as his fingers struck the key desperately. The door swung open crazily upon its hinges. A deafening report shook the chamber. Freddie Townsend felt a sharp stab of pain in his right side. Everything was going around. He slipped to the floor, turning as he did so. Bending over him were the gleaming eyes of the Master. And beyond him stood—the squat figure of Rogers! Rogers, who had slipped unseen from his blankets at the construction camp and silently followed Freddie Townsend to the main settlement. It had been he, who had tried to creep silently up the stairs and capture Freddie. But Freddie's ears had been too sharp.

"Did you get that message off?" hissed the Master.

Freddie Townsend raised his head with an effort.

"No, damn you!"

The Master straightened up with an air of relief.

"Thank God!"

## CHAPTER V

BORNE across Lake Magad in the still of the night came the report of the Master's pistol shot. Over the mud flats and marshes it went to the concentrating plant under the shadow of Olomoti and to the ears of Doctor Franz Gould. For a minute the Doctor sat up in his bunk, puzzled. Then, from the room adjoining he heard the buzz of the phone calling from the main settlement. Two minutes later Doctor Gould was informed that his presence was desired at the main settlement of Solaropolis. He was ordered to dress quickly, after which he was escorted from the plant under heavy guard.

Somehow the Doctor could not keep from believing that Freddie Townsend had had something to do with that report he had heard ring across the crater. As he trudged along with his guard he wondered what it would all lead to and if indeed, he and Townsend would be fortunate enough to emerge from the chaos alive. He remembered Konrad's statement that he and Townsend were alive only because of his, Konrad's, grace.

Dawn broke as the party skirted the shores of Lake Magad. Morning was well advanced when the party, weary from their forced march, at length gained the main settlement. But there was no respite. They were met immediately by Rogers and the prisoner was escorted to the chamber to which they had been taken upon the day of their arrival in Solaropolis.

Around the room stood half a dozen guards. At his table sat Max Konrad. In an easy lounging chair Freddie Townsend sat propped up with many pillows. His face was pale and drawn and Doctor Gould immediately guessed

the reason for the shot he had heard. A mocking smile illuminated the eyes of Max Konrad as the Doctor looked about the room with questioning eyes.

"A H, my friend! You have come. It is well. I am sorry to have had to ask you to submit to the inconvenience of coming here at this hour—or rather, of tramping across the crater at the hour you did. But my business is quite important."

Doctor Gould said nothing. He awaited the words of the man whose eyes gleamed in anticipation of that which he was about to execute.

"You see," went on Konrad, "my men are all loyal to me—oh, very loyal. So when my good friend Townsend deserted the construction camp and attempted to take command of Solaropolis, Rogers followed him and put a halt to his plans. He rather mussed up my radio operator but the man will be back at his post before long."

He paused and eyed his prisoners. He seemed to be enjoying himself greatly as he spread his hands upon his desk, palms downward, and chuckled deeply.

"Yes," he went on. "As I have said, Rogers is loyal. It pains me, Townsend, to find that you could not be like Rogers. Your friend, Doctor Gould, has gone willingly to my power plant to take up his part in the machinery of Solaropolis. It is too bad that you could not have done your part, also. Why must you be a thorn in my side?"

"I did not join you from my own choice, Max Konrad," returned Townsend in a low voice. "I shall not submit to your plan—shall not become part of your insane scheme!"

"Scheme? What scheme?"

Townsend's lip curled.

"You know very well. Your scheme to rob the penitentiaries of men with

whom to populate your crazy Solaropolis! Oh, I know. I saw that plane you stole. And Rogers has as good as admitted that I'm right."

The Master whirled upon Rogers.

"What have you been telling him?"

Rogers was trembling under the Master's piercing eyes.

"Nothing!" he insisted. "Nothing! He has guessed it all."

The Master turned back to Townsend.

"Fool!" he hissed, his suave demeanor completely vanished. "Only those, who are loyal to me, can know of my plans and live!"

"Don't you think that you've got enough murders on your hands, Konrad, without adding another?" asked Doctor Gould quickly.

Konrad whirled to face the Doctor. He laughed shortly, mirthlessly.

"I do not! You shall go with Townsend! You are both too inquisitive—too smart!"

There was a moment of painful silence. Then the Master waved his hand in a gesture.

"Take them away," he ordered imperiously. "When the younger has sufficiently recovered, I promise you all a show worth attending!"

"You forget the law, Konrad," insisted Doctor Gould.

"Bah! Law! Ha, ha! What is law? It depends greatly upon the point of view, don't you think?"

The Doctor did not answer.

"Take them away," commanded the Master again, and the Doctor was led away while Freddie Townsend was carried close behind.

## CHAPTER VI

ANOTHER week slipped slowly into eternity. The two prisoners, confined separately, were close-

ly guarded. At the end of that week Freddie Townsend was able to again get about on his own feet. It was then that the Master again called for the two men to be brought before him.

Both Doctor Gould and Freddie Townsend knew it to be their sentence of death. But they did not waver. Both men had resolved to fight if possible—fight to the end. But each also feared that they would be given little chance of an even break.

The Master was smiling—they could tell from his eyes—as his prisoners were again brought before him. It seemed to give him great delight to think of the sentence he was about to pronounce.

"Ah, my friends! We are together again. It is well."

Again his hands were spread palms downward upon his desk and that deep chuckle came from beneath his mask.

"The last time that we were together we had a slight disagreement—but perhaps you have forgotten?"

Konrad was playing with them. The Doctor and his companion held their tongues.

"Surely you do not feel ill toward me still?"

Still no reply.

"It would be a pity to take away two men—of such wonderful physical fitness and mental ability," continued Konrad. "So I have been thinking—I am quite generous, you know—I have been thinking, perhaps the Doctor and his impulsive young friend have repented since our last meeting. And, if so . . . well, perhaps we can get together, after all."

The Doctor eyed Konrad steadily.

"If you are still endeavoring to make me see your side of this monstrous scheme of yours, it is useless."

"But, what is so 'monstrous' about it, as you put it? Surely to remove a

few unfortunates from behind prison bars and give them an opportunity of making something of themselves is not to be termed as 'monstrous.' You do me an injustice, my friend."

"I suppose it's all right to kill perfectly honest men in order to carry out your scheme, too?" inquired Townsend.

The Master scowled.

"Your choice of words is very crude," he protested at length. "You make it very difficult for me."

"Not at all," returned Freddie. "We gave you our answers a week ago. There's no change to be made at this time."

The Master shrugged.

He gave a signal. The guards closed in about the prisoners. Konrad arose and followed the procession from the chamber.

Across the street they were taken and presently found themselves standing upon the metal platform above the machinery of the power plant of Solaropolis. Konrad was walking across the catwalk. Upon reaching the metal tube in the center of the room, he unlocked the door therein, that had been noticed by Doctor Gould and Freddie Townsend upon their initial visit to the plant. Without opening the portal, the Master turned and retracted his steps to where the prisoners stood.

"YOU still wish to defy me?"

"For the last time, Konrad," returned the Doctor. "We DO!"

Konrad nodded. Opening a cabinet that hung from the wall nearby, he extracted a number of masks which he handed to the guards. They immediately donned them as did Konrad. Upon glancing below, Doctor Gould and Freddie Townsend noticed that the men at work in the room below them had also

donned these masks. They were shining, silver colored things, with two tiny eye-like lenses and what was apparently an oxygen tank hanging from the chin. The Doctor and Townsend were not offered one.

Now they took strange, grey suits from the cabinet and quickly drew them on over their clothing. In two minutes every figure in sight except the two prisoners were clad from head to foot and appeared for all the world like grotesque goblins. Konrad detached himself from the others and retraced his steps to the central tube. Very slightly he opened the door.

From within there suddenly shot a blinding light. Doctor Gould and Freddie Townsend instinctively threw their hands to their faces and whirled quickly, placing their backs to the light.

Instantly there flashed into the minds of each what that metal tube contained. It was the intake from each of the concentrating plants about the crater! The concentrated power of the sun from millions of square inches of intercepted energy! The power of Solaropolis! And Max Konrad had threatened to kill his prisoners. This then, was how he would do it. They would be thrust into this tube. In an instant the diabolical act would be over, all traces of their mortal remains gone. It was ghastly. Essence of the Devil!

Now the guards had grasped each of the prisoners by an arm and were urging them across the metal catwalk. The blistering heat had already blistered their hands and faces. It would not take it long to do for Townsend, who, not fully recovered from his wound, had sunk to his knees upon the catwalk.

Two of the guards were urging him forward roughly and Max Konrad, losing patience, came clumsily forward

from his station at the tube door. He was half way between the group and the tube when Doctor Gould wrenched suddenly free from his captors and lunged straight toward the Master.

**T**AKEN so suddenly by surprise, Konrad could but stumble to one side. Although he managed to avoid Gould's direct rush, the Doctor struck him with sufficient force to send him hurtling against the metal guard on the side of the catwalk. For an instant only his grotesque figure balanced there. Then, with a muffled cry from beneath the shining mask, he toppled over the side. For a moment he seemed to hang in space over the wavering beams of light and flashing mirrors and prisms below. Then he plunged with a crash into the mass. There was a hiss, a smell of burning flesh, then the Master tumbled from the machinery assisted by the men on the floor. But he left his right arm, scorched and blackened, behind him.

It all happened so suddenly that for a moment all seemed stunned into mute incomprehension. Thus was Freddie Townsend enabled to turn once more from the blinding glare and white heat of the concentrating tube and creep off the catwalk to the platform from whence they had started. Doctor Gould also managed to retreat from the catwalk, though his Van Dyke had been singed to a stump and his eyebrows were completely missing. His hair, too, had been shortened considerably.

But now the guards were upon them again. And they knew now that their time must be short. There could be no hope for mercy after this. Roughly they were seized again and dragged toward the catwalk.

At that instant a terrific explosion shook Solaropolis.

## CHAPTER VII

**D**OCTOR GOULD and Freddie Townsend did not wait to determine the cause of the explosion. The guards were thrown into confusion, as were the workmen in the room below the platform. So the two prisoners gathered themselves together and rushed to the stairway leading upward to the street. One guard made a feeble attempt to stop the Doctor but that worthy, thoroughly roused, flattened the man with a single blow.

In the streets of Solaropolis confusion reigned. Gould and Townsend turned their eyes toward Lake Magad and swept the expanse of the crater's floor. A heavy cloud of dust and smoke hung over a point some two miles from the settlement. Then they glanced upward.

Circling the crater was the giant amphibian airplane that Townsend had seen land in the crater one week before. There was no roar of powerful motors. Only a low, steady hum much like that which is often heard over an electrical transmission line. And as the two men watched a dark object detached itself from the fuselage of the craft and darted earthward.

"Another bomb!" shouted Townsend. "Look out!"

He and the Doctor dropped flat upon the ground. The bomb struck a half mile from the settlement. A geyser of earth spewed upward accompanied by a deafening roar. The earth shook. The buildings of Solaropolis rattled. Again the men arose to inspect the damage. The bomb had registered a direct hit upon one of the transmission lines!

"It's time to get out of town," decided Townsend and the Doctor nodded his agreement. Swiftly the two fled from Solaropolis, heading toward the

rim of the crater behind the town. Other men streamed out of the place with them. There was no thought of friend or foe now; self-preservation was their only desire.

The plane swooped toward the settlement. Again they saw an object dart downward. It struck close to the edge of the buildings and burst with a terrific detonation. Buildings collapsed like card houses. One of the radio towers twisted and crumpled earthward. Flames darted up from the half-demolished buildings.

**"LOOK!"** cried Freddie. "He's going to land."

Sure enough the aircraft was gliding swiftly to the level strip between the settlement and the shore of Lake Magad. The Doctor shaded his eyes with his hand and peered at the landing craft.

"It is the strangest thing I ever heard of," he said. "The Master's own craft bombing his settlement."

Now that the danger of the aerial bombs had been removed, the two prisoners retraced their steps hurriedly toward the settlement and the grounded airplane. As they reached the half-demolished city and turned toward the landing field, a figure emerged from the plane. Another followed. Then a third stepped into view. Two of them were dressed not as aviators, but like Doctor Gould and Freddie Townsend.

"Renault and Travers!" exclaimed Townsend stopping dead still in his tracks. "How in—" But the Doctor's wondering cry interrupted.

"Max Konrad!"

The man who accompanied Travers and Renault was of doubtless Teutonic birth. His natural dark features, from long exposure under the African sun, had acquired a bronze hue, not far removed from the color of the lighter



natives. He was a young man. But his features reflected none of the ease and comforts of civilization. There were no traces of superfluous flesh. His face and body had given way to more finely chiseled lines.

The flyers spied the Doctor and Freddie at the same time. They hurried forward, rifles in hand, to greet them. But Max Konrad carried not a rifle but one of those strange flashlight-shaped weapons with the handle of a modern pistol.

As the two parties met Konrad quickly issued orders.

"Travers and Renault guard the plane. Doctor Gould and Townsend come with me."

Doctor Gould opened his mouth to voice a protest. But Travers quickly spoke.

"Don't stop to ask questions. Go with him. Max Konrad is not the man who captured you and Townsend. He himself has been something of a prisoner for the past two years."

From his belt the grim-faced Konrad drew two more weapons similar to the one he carried and thrust them toward Doctor Gould and Townsend.

"Take these. They're violet-ray guns. Good for about a dozen rays. Pull the trigger same as you would on an ordinary pistol. Only for God's sake don't aim at anyone you don't want to kill!"

Quickly he led the way back to the building from which Townsend and Doctor Gould had just escaped. Down the stairs he went and out upon the metal platform over the room.

Now there were no brilliant lights playing about the mysterious mirrors and prisms. The real Max Konrad's aerial bomb had effectively severed the power line.

The room was almost deserted. Only a group of half a dozen men were huddled about a figure that sat propped up

against the wall beyond the catwalk. And below the catwalk, lying blackened and burned across a series of mirrors, lay the Master's right arm.

Now Max Konrad was towering over the group below him.

"NOT a move!" he snapped out in a cold, harsh voice. "Stand to one side and face me and drop your weapons." Half a dozen violet-ray guns clattered to the floor. And despite the loss of his arm but a few minutes previous, the Master's black eyes, gleaming hate from beneath his mask, told plainly that he was conscious.

"Two years I've waited for this," cried Max Konrad with a ring of triumph in his voice. "Now, you," he motioned to one of the men nearest the Master, "take off these fellows' masks—your own first. And leave the Master until last."

Slowly the fellow complied. They had already removed the grey suits and helmets that they had worn for the intended execution of Doctor Gould and Freddie Townsend. Freddie glanced at the door opening into the tube. But now the interior was but a black void.

Among the six men who now stood revealed were represented five different races. But Konrad paid little attention to them save to see that none reached for their fallen weapons.

"Now then!" he waved an arm toward the Master. "Off with his muzzle!"

Slowly the man drew the thing from the Master's face. The grey features of a suffering middle aged man were revealed. Konrad chuckled with satisfaction. Freddie Townsend peered at the man with a puzzled expression. But Doctor Franz Gould gasped sharply and took a step backward.

"Robert Kaplin!" was the Doctor's tremulous cry.

Konrad laughed grimly.

"Yes, Robert Kaplin," Konrad repeated. "You see it with your own eyes. You cannot deny it. Yes, Robert Kaplin, the man who, when he could not bend me to his will in the civilized world, followed me into the wilderness and with the powers of my own discoveries, pressed me into helpless servitude—or rather," smirked Konrad, "he thought he did."

"But—but—" Doctor Gould was groping to understand. Konrad held up a hand for silence.

"**W**AIT. Look at those men."

The unmasked men were peering curiously at the man they had known as the Master. But their curiosity was largely from Konrad's announcement that the man's name was Robert Kaplin.

"Even them he fooled," continued Konrad. "He took my name, committed his crime at Devil's Island and since then at a number of other places under my name. When you came here and mistook him for Max Konrad, he did not deny it, but instead went on to impress upon you the hatred he harbored for Robert Kaplin. It was a clever way to throw intruders off his trail and lay blame for every crime he had committed upon myself.

"I could see there was no use trying to buck him, so when he followed me on a hunting trip into Tanganyika Territory and took me prisoner, I pretended to fall in with his scheme. He forced me to fly the plane on his numerous trips and—"

"But where did he get the plane?" asked Doctor Gould.

"He owns controlling interest in the United-African Airlines. He took the ship out of his own accord from Mom-

basa, forced the pilot to land here, and when the fellow would have nothing to do with his scheme, coolly shot him in the back."

"God!" breathed Doctor Gould.

"I took the job," continued Konrad, "hoping that something would turn up eventually, knowing that if I opposed Kaplin he would treat me the same way. Well, that opportunity turned up this morning when he sent me out to capture Travers and Renault because he couldn't get away. I managed to get Travers and Renault away from the others and over to the airplane hangar. No one suspected anything when the Master's own plane took off. That's why they had no warning. Before they were able to bring their protecting ray into play to explode our bombs in mid-air, we had struck and disrupted the main transmission line."

"But how did Kaplan ever find out how to build all this?" Doctor Gould wanted to know as he gestured around the room with a sweep of his arm.

"Simple. He had my camp searched when he caught me and of course I had all my research results on paper and in camp with me. You see, I had intended to retire from civilization for a while and await developments. I thought perhaps that if the public once realized the importance of my discoveries and the intentions of Kaplin, they might come to my assistance."

"Well," mused Doctor Gould. And at that instant Travers burst into the room.

"**S**AY!" he cried. "There's a column of soldiers coming down the side of the crater!"

Only for an instant was their attention diverted from the unmasked Solaropolitans. But one of them sprang forward in that instant and recovered one of the fallen violet-ray guns. Freddie

Townsend saw the man's move out of the corner of his eye and whirled pulling the trigger of his own gun as he did so. Both guns flashed death at the same instant. The man below dropped without a word. But it was not Freddie Townsend who fell upon the platform. Max Konrad's tall form swayed for an instant, then plunged forward to lay limply upon the platform. It was all over in an instant. But it was the signal for a general battle.

Three men were killed as the others rushed forward to recover their weapons. Then did Travers, Gould and Townsend beat a hasty retreat from the room.

A hundred British marines were scattering the settlement and from skirmish position as the three headed toward the military protection. Renault met them and together the four hurried away from Solaropolis and behind the British lines.

"Now how in the devil did these fellows get here?" Travers wanted to know.

Freddie Townsend chuckled. It was a rather weak chuckle for the events of the past hour had been rather strenuous for a man not fully recovered from a bullet wound.

"I guess I'm as big a liar as Max Konrad was to Robert Kaplin," he told them. "You see, on the night that they caught me in the radio room, the Master wanted to know if I got my message through. I replied that I didn't. Well—"

"You lied like a gentleman," cut in

Travers solemnly, yet there was a twinkle in his eyes.

THE rest of this history is brief. Solaropolis is no more. Whether or not the Sunlight Master yet exists, there is no way of telling. Strangely enough, when the Britons rounded up the handful of Solaropolitans, the Master was nowhere to be found. His blackened arm and discarded mask were all he left behind him. Nor were they able to find any traces of the records of the unfortunate Max Konrad. Much of the scientific equipment was salvaged. But the most important or "key" parts to the sunlight equipment were destroyed by the Solaropolitans when it became evident that the settlement was doomed.

As to whom Robert Kaplin kept in touch with, by means of his wireless outfit, is not known. Doubtless a confederate, in the heart of civilization, who melted into obscurity with the passing of Solaropolis and its master. The motors of the great airplane, too, were found to be damaged beyond repair. During the excitement occasioned by the arrival of the marines it had been left unguarded. Perhaps a chance ray—who knows?

Doctor Gould, Freddie Townsend, Travers and Renault really do not care. They are willing to let the whole affair be forgotten. They are content to sit together before Doctor Gould's crackling fireplace and, over their pipes and cigars, reminisce on days gone by. To them Solaropolis is but the name of a past adventure.

THE END

# Earth Rehabilitators, Consolidated

By HENRY J. KOSTKOS

## Conclusion

*There has been excitement enough in this story's first part, but the second part will be found to surpass it with its meed of inspiring adventure, plotting and counteracting the attacking forces. It will hold the reader to a finale which we will let them ascertain from the rather absorbing text. There is a sort of lesson or development of a theory in it, to the effect that man can be good, and that the power to be such is in his being.*

## What Has Gone Before:

Earth was covered with ice and was an abandoned planet—all life was supposed to be extinct. Warren Bancroft, a descendant of Earthians, living now on Saturn, was deeply interested in exploring excavations being carried on by Professor Ru Va and his party on earth. Bancroft's ancestor Gordon had his great research laboratory at that very spot, 41° north and 75° west. The ice coating had been penetrated and some strange metallic object and a plate with writing on it were found by Professor Va. Bancroft was of straight earth descent, and was consequently looked down upon by the haughty Saturnians. But if Warren Bancroft could recover the secrets of "The Great Discovery," so called, buried in Gordon Bancroft's terrestrial laboratory, he might be able to restore the earth by Gordon's "Super Atmosphere" and make his way to fame and capture the heart of the woman he loved.

Gurra was a repulsive being, a Plutonian, abhorrent to all the earthmen, and his desire was to have Nita for his wife—a terrible fate for her if carried out. The father lived in fear of Gurra and Nita was in dread of his surrendering her to the monster. Nita was a beautiful Saturnian, whom Warren Bancroft hoped to win for himself.

Warren started for the earth with a party of Earthmen and of course with Nita. The Saturnians failed in stopping them and the ship took off after the attack was repulsed. A police vessel which chased them was disabled by a meteor and one which struck the Earthmen's ship, the "Earthbound," simply helped it on its way. The ship reached earth and landed on the ice-bound Pacific Ocean. With protective suits a party of four, including Nita, with War-

ren in command, started off in a rocket propelled sled for Professor Va's excavations, clear across North America. After some rough traveling, nearly leading to disaster, the party reached Professor Va's camp and excavation.

Warren and Ross decided to investigate the camp and they find the bodies of five murdered men. Warren believed that Gurra, the Plutonian, had done the deed. Gurra it was and he lay in ambush and tried to kill Warren and Ross, and failed, but captured Nita and Palmer. The two, who had escaped him, found warmth from hot springs in a deep crevasse. Nita was not with them, she had been left in the sled with Palmer. Had Gurra taken off for Saturn with her? Warren and Ross escaped from the crevasse and met a group of Bear-Men, descendants of the old-time inhabitants of earth. The leader of the Bear-Men was named Drew Harv. The Bear-Men led them off and gave them a meal in a cavernous chamber hewed out of rock. They were virtually prisoners and began to suspect the motives actuating Drew Harv. The Bear-Men had a blue crystal that they manufactured, a radio-active compound Rodonite, that had wonderful power. It could cook food and could penetrate rock. Warren and Ross received a quantity of it from the Bear-Men after they had been accepted as friends. They reached the surface and found the sled gone—Gurra must have taken it, they thought—and the "ship" "Earthbound" was 6,000 miles away. They found a frozen lake and penetrated the ice with Rodonite and reached a depth of over two hundred feet, and by the use of another substance, Urvion, they overcame the violence of action and saw at the bottom the remains of some old-time civilization.

## CHAPTER X

ENTHUSED by their unexpected good fortune, Warren and Ross hastened to pick up their tools and slide down the side of the fissure. They dug around in the ruins joyfully, unearthing masonry, rusted machinery, broken chemical and physical apparatus, gas tanks and other pieces of equipment that indicated beyond doubt that they had found Gordon Bancroft's laboratory. Some of the more valuable items they laid aside in one place to take along with them. But they were chiefly concerned with trying to find the large steel safe that Warren knew had been used for storing the precious formulae that the scientist would not trust even to a bank-vault.

Their search came to an end when a dull metallic ring of Ross' pickaxe proclaimed that he had struck the huge steel box. Both men dug lustily, clearing the safe door of earth and stones. The task of opening the door proved to be a problem until Ross gingerly placed a minute quantity of Radonite on the combination lock and watched it melt through the hard metal as if it had been butter. Then the door swung open. Both men peeked within. There, lying in neat bundles on the steel shelves, were the note books containing the priceless formulae of Warren's famous ancestor. As he carefully thumbed through the precious documents, now yellow with age, Warren's eyes shone with a brilliance that Ross had never seen before. The results of the scientist's experiments were all neatly typed on parchment and bound in folders, each one properly labelled. So it was that Warren found with little difficulty the one for which he had braved this perilous journey, and for which he had perhaps lost the one girl who had come

to mean everything in the world to him.

But strangely enough he could not feel depressed now. Here in his hands he held the key to a new era, a formula which would be a boon to mankind, and at the same time enable him to take his place among the famous scientists of the universe. Here it was; he opened it almost reverently to find a mass of figures, chemical equations and sketches that Gordon had so painstakingly evolved, but which he never had the opportunity to try on the vast scale he had intended.

They bundled up their precious cargo and returned through the tunnel to the caves. They found Drew Harv waiting for them.

"I SEE that you have found that which you sought. It is good. The Three Ancients have instructed me to summon you to their presence. Are you ready?"

The men nodded and followed Harv through one rock chamber after another. At the bottom of a steep flight of stone steps there was a massive copper door. Harv reached for a leather thong that was hung from the ceiling and pulled hard. From within came the mellow sound of a trumpet and at once the door swung open. Warren and Ross entered with something closely akin to reverence, and advanced to an elevated platform where, on chairs carved from granite and decorated with copper ornamentation, sat the Three Ancients.

Their long beards, white as new-blown snow, reached well down upon emaciated chests. Their faces were wrinkled, but their eyes looked at the two descendants from their common ancestors with the unrestrained interest of wonder-stricken children. The two visitors bowed stiffly and waited for the rulers of the Dwellers of the Caves to speak.





*There could be no mistaking that voice once it had been heard. It was Gurral! Clad in a space suit and helmeted, he burst from his flagship, fighting mad.*

"I have brought before you, Venerable Fathers, these two men, Warren Bancroft and Ross Griffin, of whom you have already been informed."

The White Beard in the centre raised his head and looked at Warren, as a father would look upon a son who brought joy to his heart. At length he spoke.

"Sons, we have followed your movements with an interest that might be considered selfish. But we too, who are descended from the glorious past civilization of our earth have felt the desire, the urge, to restore to this cold planet the glory and prestige which it once enjoyed. Your aim is a noble one, and needless to say, all the aid we can give you shall be yours.

"But enough of this sentimentalizing. I am an old man, as are my associates," and he gravely indicated with his hand the two men, one on his right and the other on his left, "and like old men, we live much in our past. It is to the future," his eyes shone with a new light of hope, "it is to the future that we must now look, with your aid, son, and with that of your loyal band of Earthmen. Now tell me, for I am eager to learn, what have you found and what are your plans."

Warren and Ross were impressed by the words and manner of the kindly old man and they related the story of their life upon Saturn, told of their preparations, the thwarting of Gurra, the landing upon earth, the long overland and oversea journey and misadventure on the plateau, when they lost Nita and X. Palmer. When Warren spoke of Nita his voice faltered for a moment, he swallowed hard and the Three Ancients nodded in sympathy.

"But it now seems that all of our work, our finding the formula for Super-Atmosphere, will be of no avail. We can not bet back to the *Earthbound*,

neither can we communicate with her."

Warren could not help voicing his discouragement. While he was occupied at some work his mind was concentrated upon a single objective: to do the best he possibly could; but when the task was completed, his moods took possession of him completely.

THE Chief of the Three Ancients rose from his dais and stepped down to Warren. He put his hand reassuringly upon the younger man's shoulder and made an enigmatic promise:

"You have done well, son. Do not worry, for you shall be absolved of the murder of Professor Du Va and the members of his expedition. Then you will be free to return to Saturn, there to present your plans officially to the learned Body of Five Hundred. Also, for I know your heart is heavy, I promise that to you, unharmed, shall be returned the maiden whom you call Nita!"

When Warren heard this prophecy he jumped forward and gripped the old man by the shoulder and looked into his face incredulously. Eagerly he plied him with questions, implored him to tell him more, but the man shook his head reluctantly and asked that he be patient until the morrow when he would learn everything he wished to know at the trial.

"What under the sun did he mean by the trial?" Warren puzzled and fretted with impatience when he was alone with Ross in their chamber. But speculate as they would, the two could find no answer.

The following morning they arose early, had their meal and sat down eagerly to wait. Soon Drew Harv came to conduct them to the grand assembly chamber. The man appeared to be inwardly excited, and though he

talked quite volubly upon many subjects, he carefully avoided any mention of the one that was foremost in the minds of Warren and Ross. When they questioned him outright about the trial, he shut up like a clam and would say no more.

Deep underground through high vaulted passages they had never entered before, the two men followed their guide. Here the walls were damp with moisture and hot steam oozed through the many cracks. The luminescence on the ceiling was just sufficient to enable them to step along cautiously without stumbling. As they came around a sharp bend they heard the murmur of voices, like the sound of waves dashing incessantly upon a wide sandy beach.

THEN they beheld the Grand Assembly Chamber suffused with a red light that shone upon the whiteness of the thousands of Bear-Men who filled the immense hall, and transformed them into shaggy red haired apes of some gigantic species. Warren and Ross scrutinized their faces closely and were relieved to find that they were of the same race as were those whom they had met previously. In the centre an aisle had been left, down which they were led towards a dais upon which the Three Ancients sat as solemn as judges of the courts that were held upon earth in the twentieth century.

Warren and Ross were motioned to a bench which had been reserved for them up front.

"This is all so mysterious. The Dwellers of the Caves evidently inherited all the love for the dramatic and spectacular, that our early ancestors were said to have possessed," Ross whispered.

"Nevertheless I wish I knew what this was all about. I am somewhat out

of mood with the whole thing." Suddenly Warren became excited and pointed down the aisle, "Look, Ross, see that black-hooded figure. . . It can't be a Bear-Man for he does not have white fur. I could swear that his walk was familiar. . . I wonder if it could be. . ."

Ross Griffin turned to where his friend pointed, and saw a stooped figure, covered to the knees with a black sack, being led up front by two husky white haired men. As he passed the bench upon which Warren and Ross were sitting the hooded figure stumbled and gave a shrill, strangled cry of fear; his guards clutched him to keep him from falling. There was something disturbingly familiar about that cry too, Warren was sure.

A mellow blast from a trumpet, then silence. Solemnly the old patriarch, sitting stiffly erect, his long white beard cascading like a silvery waterfall over his thin chest, looked at the hooded figure, as if his vision could penetrate that black covering.

"You, who are to remain nameless for the time, have been brought before us charged with crimes. Here on earth, although you might not have known, deeds of violence are punishable by perpetual confinement in the Caves of Ice. There the life fluids are solidified and the victim lives in suspended animation. We do not take life."

When it heard this, the black hooded figure trembled as if with ague, and would have sunk to the stone floor were it not for the support of his guards. The old patriarch continued; his voice was portentous and the accusations they heard astonished Warren and Ross beyond description, but gave them a sense of relief. Now they began to see a light, to understand the enigmatic utterance of the Chief of the Three Ancients at their first meeting. The two men leaned forward on their stone

benches and listened with tense expressions.

"Can you deny," and the old patriarch pointed a stern unwavering finger at the quaking, black-cloaked figure, "that you had attempted to murder the Earthmen from Saturn, they who are named Warren Bancroft, Ross Griffin and X. Palmer? Can you deny your attempt to abduct the Saturnian girl, Nita? And have you not, in order to throw suspicion upon Warren Bancroft, murdered in cold blood the gentle Professor Ru Va and his men. Remove his hood!"

Like a field of ripening grain in a wind the movements of thousands of heads could be heard as they craned forward to see the prisoners. Although Warren and Ross had surmised what they were about to witness, they could hardly credit their senses even after the hood had been pulled up to reveal the ugly features of the fear-stricken Gurra. The coal-black face of the creature was now blanched to an ashen grey, his gnarled body trembled and he shrieked a denial wildly.

"No, no, I did not do it. It was my men. I could not control them. Tell them, Warren," he implored and fell to his knees in front of Bancroft who recoiled as from some slimy monster, "tell them it is not true—it is not true—" and the man tore at his black wooly hair and his bloodshot eyes rolled like those of a maniac.

To Warren it was not a pretty sight. While unmoved by any feeling of pity, the Earthman nevertheless felt impelled to say something that would enable the Plutonian to regain a more normal composure. He rose to his feet to address the Chief of the Ancients.

"No Warren, not now. You will be heard in due time," said the patriarch gently as he waved him to his seat. "First we must bring in another wit-

ness, one whose heart might not be as soft as yours."

And as he motioned to an attendant, another hooded figure was led up to the dais. But unlike the cowering Gurra, this man walked erect, with a pride that only an Earthman could possess.

"REMOVE his hood," the Ancient commanded tersely.

The black covering came off and there, unharmed and smiling was their mechanical expert, X. Palmer! The two men sprang from their benches and rushed forward to clasp the man's hand warmly. They excitedly asked about Nita, but before he was given an opportunity to reply the judges commanded Warren and Ross to be seated as the third hooded figure was ushered in.

This one was a slimmer person than any one of the others, walked more lightly, more gracefully. The sight of the tiny shoes that stepped forward daintily under the long black hood made Warren's heart thump wildly. Even before the attendants could take off the black covering he rushed forward eagerly, his face warm with a flush of joy, and he pulled the hood from the figure. He could never have mistaken Nita, no matter how she might have been attired. Here she was in his arms once again, radiant and happy and as lovely as ever. Her eyes glistened with tears that were past controlling; she buried her face on his shoulder and wept from sheer joy. Eagerly they whispered to one another, oblivious of the thousands who looked upon them with sympathy born of understanding.

Gently the Ancient upon the right hand throne stepped down and led them to a bench where they sat engrossed with one another. But the stern business of the trial claimed their unwilling attention. X. Palmer was on the stand.

## CHAPTER XI

THE engine expert testified that when he and Nita returned to the sled, Gurra and his band crept up and blinded the surprised Warren and Ross with their ray lamps. The Plutonians had apparently been hiding near by, waiting to catch them off their guard. As Palmer and Nita watched, immobile with horror, they saw their friends swept by the searing beams of the flame knives, until they were forced over the edge of the crevasse to what appeared to be certain death. Then Nita and Palmer were surrounded by the black Plutonians. How they managed to evade their attackers they did not know to this day. But impelled by panic, they broke through the circle of demons, aided by some lusty blows from the heavy bar of metal that Palmer had snatched up, until they had nothing in front of them but the impenetrable darkness. But behind them was a howling mob of bloodthirsty Plutonians.

They fled as fast as their legs could carry them. If anything, Nita was even speedier than Palmer, and it was she who found the entrance to the passage that led to the caves of the Bear-Men. But they were far from being out of danger yet. They heard the thud of pursuing feet as the Plutonians, with a shout of triumph, plunged underground after them, their flame-knives lighting up the rock walls to incandescence.

Here the two were compelled to go slower as it was pitch dark ahead and the uneven floor was strewn with boulders and slippery with ice. From the walls sharp jagged rocks projected which cut their faces and bodies cruelly. Two of the black men caught up with them. Palmer wheeled furiously and with two well aimed blows with his bar of metal, laid them out cold. But still the mob

gained and again Palmer was forced to beat off their pursuers.

Then as they ran down deeper into the tunnel, a group of strange shaggy white creatures, the Bear-Men, aroused by the tumult, rushed towards them. The Plutonians, cowardly by nature, seeing this unexpected horde of what they believed to be wild animals, turned and fled, but not before Palmer singled out Gurra who had been exhorting his men from the rear to seize the two fugitives, and hurled the metal bar straight at him. His aim was true. The bar whizzed through the air and struck the black, ugly creature full in the chest and knocked the wind out of him. The others, seeing their leader sink to the floor of the tunnel, clambered over his body in panic. They did not pause in their flight until they had regained their ship and took off for Pluto with a weird tale.

Palmer related his story modestly in a calm even voice as if he had been a spectator only instead of a heroic participant. When he finished, the assembled dwellers of the Caves waited expectantly; the accused Gurra, now even more ashen than before, was kept from collapsing through fear by his stout guards.

But there was more to come. The silence was broken by the ominous voice of the Chief of the Three Ancients:

"Gurra of Pluto, you have heard these charges. Do you dare deny them? Before you answer, think well, for we men of earth have strange and, might I say it, effective ways of extracting the truth. Now speak?"

The black man gulped. His hands writhed as if he was in agony. Then his lips moved:

"Yes, if you will have mercy, Oh, judge, I will tell you that this honorable man is right. But the blame is not on me alone. My men. . ."



"Enough!" commanded the Ancient sternly. "You stand convicted on these charges. Now we will hear from Drew Harv."

HARV walked up to the dais and bowed to the Three Ancients before beginning his story.

Two days before they had met Warren and Ross, he and his scouting party had seen a huge black shape sailing down out of the sky. Although they watched it with wide-open, wondering eyes it was lost to sight beyond the plateau above them. It had passed swiftly but their keen eyes had been able to catch a glimpse of black faces flattened against an observation window. Of course at that time they had no idea what the thing might be, but since the coming of the three Earthmen and Nita they realized that what they had looked upon, with some misgivings, was a space ship from an outer world.

Soon after, just before dusk, the stillness of the air had been rent by the most awful cries of terror and agony. Then silence, and again they beheld the space ship, but this time it was flying away. Several days later they came upon Nita and Palmer and Gurra in the tunnel and later they found Warren and Ross in the crevasse. They had purposely withheld any information regarding one another from the two groups, until they heard their stories and were able to compare them.

There was no question now in the minds of the Dwellers of the Caves that Gurra was guilty of all charges, including the murder and mutilation of the bodies of Professor Ru Va and his men. When Gurra screamed a denial of this, he was reminded of the horrors of the Caves of Ice, where even those of stout heart have been persuaded to tell the truth, whereupon he broke down and babbled an incoherent con-

fession. He admitted that he had ordered his men to commit the horrible deed for the purpose of casting suspicion upon Bancroft and to steal the findings of the expedition.

Ross Griffin had been busily taking down Gurra's confession, in Saturnian and when the man finished he handed it to him to sign. The Plutonian demurred but one of his guards grasped his upper arm in a vise-like grip until he reluctantly scrawled his signature at the bottom of the document. Then after the Three Ancients had signed as witnesses, Warren carefully folded the confession and placed it in a pocket of his jacket.

The old patriarch rose from his dais and a hush came over the multitude. Then pointing to the cringing Gurra he shouted in a voice that reverberated from the farthestmost recesses of the immense cave:

"Fellow Earthmen, you have heard the testimony of our brothers and the confession of this cowardly Plutonian. My two fellow judges and myself, were we acting according to the tenets of our forefathers, would ask that, in the name of justice, death be the sentence. But our new laws are more merciful, though on Pluto I am given to understand, much cruelty is practised by those who consider themselves our superiors in civilization. Now we, your rulers, ask of you, what are your wishes?"

Like a pent-up torrent suddenly released came a cry from thousands of throats:

"The Ice Caves! The Ice Caves!"

Warren turned to look at Gurra, just as the Plutonian sank unconscious to the floor. His guards yanked him roughly to his feet and shook him back to a dazed animation.

When the tumult had died down Warren walked up to the Three Ancients and addressed them.

"It is with a feeling of gratitude that

my associates and myself appear before you now. And we desire to have it understood that we respect your judgment and that of your people. I can truthfully say that nothing would give me greater pleasure than to be left alone with that monster for a few minutes. But this planet, our earth, is destined to rise to great heights as a member of the Federation of the Universe. And what better way to begin to gain the respect of all the worlds than to abide by interstellar laws?

"You have judged wisely and I am sure that the weight of decent opinion would be behind you. But this man has an evil power on the planet Pluto and its dark sister planet beyond, called Thor. I beseech you to imprison Gurra, until he can be tried in the courts of Interstellar Justice. There, I am sure, he will be convicted as he justly deserves and be sentenced to a punishment even more rigorous than the Caves of Ice."

The Three Ancients and their followers listened gravely and respectfully to Warren's plea. There was not a single murmur of dissent when the chief, after a whispered consultation with his colleagues, agreed to the proposal. Gurra, realizing that his life had been spared, began to sputter his thanks in false, sugary tones, but Warren drew back from the creature in disgust and the man was removed from the Assembly Hall to his cell.

The days immediately following these surprising events were indeed busy ones for Warren and his companions. The only obstacle in the way of carrying out his plans was to find a means of reaching or communicating with the *Earthbound*. Working on the theory that Wass Dorn would conclude that something was amiss with the members of the sled expedition, whereupon he would attempt to navigate the ship to northern New Jersey, Warren sent Palmer up

through the passage to the plateau to await the possible arrival of the ship.

A few hours later Palmer returned, his usual imperturbability displaced by excitement over finding the rocket-sled down in the valley where it had evidently been tossed by the keel of the Plutonian ship when it took off in haste. Although the sled was wrecked beyond possibility of repair, the communiograph was in an operative condition. The resourceful engine expert had tested it but did not wait to signal the *Earthbound*. Hardly pausing to hear the remainder of Palmer's story, Warren, accompanied by Nita, headed for the tunnel.

THE sled was lying on its side with the runners twisted and bent and the cabin knocked from the chassis. Warren hurriedly threw the communiograph switch and spoke into the transmitter:

"Warren Bancroft calling the *Earthbound*."

He repeated the call again and again until his voice was hoarse. There was no answer. Then Nita relieved him and continued the effort to raise the ship.

"It's no use, Nita. Rest a while and we will try again . . ."

"Hush, Warren," she cut in, "I hear something!" and she twisted the volume dial frantically. From the loud speaker came the unmistakable booming voice of Wass Dorn:

"This is the *Earthbound*, Mr. Bancroft. We have been trying for weeks to raise you. Where are you?"

"We are at our destination but ran into trouble. Can you leave at once?"

"We are under way now; in fact we have been searching for your location for the past three days. Send out the directional beam so that we can follow it."

Warren excitedly switched off the

talking circuit and threw on the beam. Then he waited for Wass Dorn to acknowledge it. In a few minutes Dorn's voice came from the instrument:

"I just charted our position and I find that we have run past you. The *Earthbound* is now 4,700 miles to the southeast of new Jersey, or over the northwestern part of Africa. Keep the directional on and we will rise above this shell of atmosphere which would burn up the ship if we attempted any speed. We'll reach you in half an hour."

To the impatient watchers those thirty minutes seemed like hours. Warren manipulated the dial controlling the directional rays and glued his eyes to the meters.

"There she is," Nita pointed up into the sky as the graceful, metal bird swooped down out of the air with a thundering of her reverse rocket-blasts. "Tell them to land over there."

Warren shouted directions into the instrument and was gratified to see the *Earthbound* ease down, like a graceful swallow, on the plateau above them. The three left the sled and ran up the icy slope to greet the crew of their ship just as they were tumbling out of the air-lock doors, armed with wicked looking blast guns.

Wass Dorn ran toward them with wide open arms and thumped the two men on the back joyfully and would have embraced Nita had she not laughingly jumped aside. Dorn explained that when they lost contact with the sled they were not worried for a while, thinking that its communiograph apparatus had gotten out of order. But when the days lengthened into weeks and still there was no word, the crew of the *Earthbound* began to fret over the fate of their leader and his companions. It was with difficulty that Wass had been able to curb their impatience, but

finally he too became worried and decided to take off and fly low over the surface of the earth with the hope of locating them.

As all the instruments required for terrestrial navigation had been taken by Warren, the ship was compelled to sail by dead reckoning and had therefore been unsuccessful. In their haste to leave Saturn they had been unable to provide more than one set of terrestrial instruments. The celestial navigation equipment was entirely unsuited for the purpose.

Warren briefly related all that had happened to them and told of his immediate plans. They would return to Saturn and lay the proposition before the Body of Five Hundred who, they felt, would in all probability aid them in the project of rehabilitating the earth.

## CHAPTER XII

TWO geologists and a chemist were assigned to the task of investigating the chemical and mineral resources of the region. They sank test pits by means of Radonite as far west as the mountains of Pennsylvania. They analyzed the specimens and catalogued their findings for future use. Meanwhile Warren with the help of Nita and Ross had been engrossed in intricate calculations to determine the volume of materials required to manufacture a sufficient quantity of Super-Atmosphere to combine with the atmosphere which they would release from above the earth. These data they would lay before the Body of Five Hundred to gain support for their gigantic earth rehabilitation plans.

They reluctantly bade farewell to the Dwellers of the Caves, with the promise that they would return as soon as they were able to obtain the equipment needed for the project. Warren

tried to persuade Drew Harv to accompany them, but the man had no desire to leave his home planet.

"I'll be here to welcome you when you return," he said. "But if he had only known what fate had in store for him perhaps he would have been more willing to go.

The flight back to Saturn was uneventful. Every one was busily engaged in planning and dreaming about the future of the planet from which their ancestors had sprung. Their stay upon earth, although cold and dreary, had nevertheless exerted a nostalgic effect upon them, and they looked forward with warm anticipation to the day when they could leave the foreign planets for good and return permanently to their own.

No sooner had the *Earthbound* come to rest outside of the Saturnian sky-city which it had left so dramatically a few months before, it was surrounded by Vigilantes who hammered upon the air-lock door for admission. Nita looked up at Warren with alarm, but he reassured her with:

"I expected it. But don't worry. With Gurra's signed confession and Gordon Bancroft's records the entire misunderstanding will be cleared away in a jiffy. It will no doubt be taken before the Crime Judge first. You return to your father and explain the whole thing to him, and I will rush right over to see you as soon as I am released."

Vic Sylvan, that hardy descendant from Norsemen, who had led the attack on the Vigilantes in Gurra's hangar, approached Warren with a determined scowl on his face, his eyes blazing with a fierce light.

"Shall we pile out and give them hell, boss? The boys are all itching for a good fight."

Warren smiled at his loyal strong-arm man and shook his head, "No, Vic,

it is not necessary this time. It is only a formality and I will be back with you in a day or two. Tell the boys to save their energy for the bigger job that is waiting to be done back on earth."

Sylvan withdrew rather reluctantly. Having primed himself for a scrap with the autocratic Vigilantes, whom he had always despised, he found it hard to resist the temptation. But, like the good soldier he was, he obeyed orders.

When the door clanged open the Vigilantes waited cautiously outside. They were not taking any more chances with the wild Earthmen, one experience of an encounter not long ago was enough to teach them the inadvisability of coming too close to these courageous people. Their blast guns were leveled as Warren walked from the ship, head erect and smiling confidently.

"Warren Bancroft, I warn you to make no hostile move. You are under arrest. Come with us at once," the Chief Vigilante was very imperious in his lingsite metal uniform which flashed silver white in his pale sunlight. "Your men also will be held for a hearing."

With a wave of his hand to Nita and his companions on the *Earthbound*, Warren entered the armored ball-car with the Vigilantes and was rolled away in the direction of the city. His first appearance before the Crime Judge took on the aspect of an inquisition. He was accused of every crime on the calendar, but when he presented the confession and the micro-photographic records that revealed the use of flame-knives, then showed the volumes of data which he had found in Gordon's safe, and finally told of his plans to rehabilitate the earth, the judge became more tractable. After whispered consultations with his associates he agreed to pass the case along to the Saturnian Chamber of Science. Meanwhile Warren was confined to a

cell to await the decision of the scientists.

It was not until three days later that Warren was led before the Chamber of Science. A grave, cold body of old men, the members of the Chamber nevertheless became enthusiastic when Warren warmed up to his subject and eloquently presented his plans.

They asked him innumerable questions, many of them of an involved technical nature, which Warren answered clearly and logically. He realized that they were testing his knowledge and by watching their expressions closely he knew that he was gaining acceptance as a fellow scientist. This was what he had dreamed of for many years, the opportunity to prove that descendants of Earthmen were as capable of mastering the sciences as were the people of other planets.

But the local chamber of science was by no means the final tribunal. It was true that their endorsement could make or break many schemes, but the proposal, that Warren had advanced, was so stupendous that only the rulers of the universe, the Body of Five Hundred, could pass upon them.

So it was that the Earthman was led back to his cell, there to fret impatiently over the red tape that delayed the fulfillment of his cherished dreams. In answer to his inquiries he was told that Nita had returned to her father's home, and his men, although held under guard, were safe, pending the decision of the supreme court on planet A7-TY.

IT was with a sense of relief that he again went before the Chamber of Science. The solemn old men seemed even more grave when they handed him an official communiograph message. As he read it, Warren's eyes lit up with delight.

EXECUTIVE OFFICE OF THE  
BODY OF FIVE HUNDRED.  
Planet A7-TY.

To the Saturnian Chamber of  
Science:

Greetings:

Release Bancroft and his men.  
Plans approved. Wait for arrival of special scientific group under the name "Earth Rehabilitators, Consolidated," who will collaborate with Bancroft and you in carrying out the project.

Signed: SVORFF KROON,  
President.

Warren did not wait for any further discussion, he was on his way to Nita's house with the good news. There he found her with her father, Professor V-Si. Quite different now was the reception accorded him by the professor. No longer did that gentleman have any fear of the ugly Gurra and he was enthusiastic in his endorsement of Warren's plans.

Taking Nita by the arm, Warren dashed out of the house and jumped into a ball-taxi with Nita. They reached the *Earthbound* in a few minutes, where he found that the message of the Body of Five Hundred had preceded them and their men had been freed from their ship-prison. Even Vic Sylvan had forgotten his animosity against the Vigilantes as he sat with them in the large mess hall, drinking the heady Kuif brew of the Saturnians.

It did not require very long for Warren Bancroft's name to be heralded far and wide throughout the universe and consequently every minute of his time was taken up by luncheons in his honor and speeches before civic and scientific bodies. He was even asked to journey to the far planets of the cosmic system, but he had to decline on the plea that his project required his constant presence on Saturn.

"This recognition that comes after

something has been accomplished irritates me. Why should I appeal to the vanity of political leaders by being exhibited as a zoological specimen when but a few months ago they despised me as an earth slave?" he complained to Nita one day when he was weary of his countless engagements. She reassured him by saying that it would not be long before they were once again on their way to their beloved earth where the Super-Atmosphere would change the nature of humanity and make life far happier.

When the "Earth Rehabilitators, Consolidated" arrived, it was a signal for a national holiday. They were escorted with all the pomp and splendor, that the ritual-loving Saturnians could devise, to the Assembly Hall of Science where Warren and his committee were waiting for them. Here, after the customary polite gestures were over with, they settled down to a detailed consideration of their problems. Committees were formed; Nita was assigned to the duties of Chief of Transportation Unit where she would be responsible for shipping men and materials to earth.

Briefly, the problem of rehabilitating the earth was twofold: the first task was to draw the atmosphere that was now rotating as a shell more than a thousand miles above the surface of the earth down to sea level, and the second was to manufacture one billion tons of Gordon Bancroft's Super-Atmosphere which would then be mixed with the oxygen and nitrogen of the air in a ratio of one part S. A. (Super Atmosphere) to one million parts regular atmosphere.

Although Warren and his men had already made conclusive laboratory tests of the processes involved and had proved to their own satisfaction the feasibility of the project, it was necessary to demonstrate the experiments for the benefit of the entire committee.

"Why not try some of the S. A. gas on a prisoner condemned to the Chamber of Purple Vapor? With the authorization of the representatives of the Body of Five Hundred we should have no difficulty in getting permission. Then they will really see what the gas can do. Now, I'm afraid, they are somewhat sceptical," Ross Griffin suggested.

The scientists agreed to the experiment, so Warren had a small room constructed of flexible glass through which the subject could be observed. The S. A. gas was available in cylinders, connections from which were piped into the chamber. The criminal, a particularly vicious specimen of an habitual murderer, was brought into the special chamber where he unwillingly submitted to having the nerve-bands of Dr. Soong's Crime Analyzer fastened to his limbs and body.

This instrument registered on a dial the intensity of the subjects criminal impulses while a series of vari-colored lamps indicated the types of crimes and his particular psychoneurosis\* would prompt him to commit.

Solemnly the committee grouped themselves around the glass walled chamber and watched Warren manipulate the control board of the analyzer. He was explaining the action of the instrument as if he had been lecturing to a group of students at the university.

"YOU gentlemen are all familiar with Dr. Soong's Crime Analyzer. Its reliability has been proven over a period of two centuries. The subject is now in normal atmosphere, which as you know consists mainly of nitrogen and oxygen, and here on Saturn, almost five per cent of hydrogen, as well as traces of argon, helium, krypton and xenon.

\* Psychoneurosis—*psyche* means the mind and *neurosis* stands for nervousness, therefore psychoneurosis means illness of the mind or a mental disease. The theory that crime is the result of mental derangement was prevalent throughout the universe at the time.



The atmosphere of the earth before the cataclysm contained the same elements except that the amount of hydrogen was infinitesimal.

"Now notice the readings of the intensity dial. This man has a crime index of 173.3, which is extremely high. The normal adult registers 7.5. I will throw the psycho-indicator. See the murder impulse lamp start into illumination. And the three other lamps also. A bad case, gentlemen.

"I will turn this valve. It admits Gordon Bancroft's Super-Atmosphere in the correct proportion. Notice how the color is changing to a reddish tinge inside. Now watch the dial."

As the scientists eagerly craned their necks towards the control board, they saw with astonishment the needle on the meter drop back slowly from the 173.3 mark until the reading was normal; the four lights grew dim and were extinguished. The man within the chamber stirred in his chair, the scowl on his face was replaced by a smile and the harsh lines became soft and gentle.

"Remarkable! Incredible!" chorused the scientists with enthusiasm.

Then Warren explained that the day before he had subjected to Super-Atmosphere a man who was about to die from the dread pulmonaritis, a disease prevalent upon Saturn because of the excessive amount of moisture in the air. Within ten minutes the man was breathing normally and within a half an hour he was on his feet!

"In order for the effect to be permanent, however, it is necessary to continue to live in the Super-Atmosphere. This man, if returned to normal air will within a few days regain all of his criminal tendencies. That is why I want to change the earth's atmosphere and use that planet as a huge laboratory, after which all the habitable planets of the entire universe may have their air

charged with the Super-Atmosphere gas," Warren explained.

### CHAPTER XIII

WHEN news of the wonderful power of this gas became known, the laboratories were besieged by thousands of people. They came from near and far, thinking to avail themselves of the curative powers of this substance. At first Warren and Ross explained patiently that the effects were not permanent, unless they were to live continuously in an atmosphere charged with it. But later the mob became unruly in their demands and insisted upon what they called their rights.

It was during one of these demonstrations that Wass Dorn rushed into Warren's office, breathless from running.

"Mr. Bancroft, there is a big black Plutonian outside inciting those people. He is down there making speeches and calling for violent action if their demands are refused. An evil looking creature, Dakku, they call him."

"Dakku?" Nita asked with a sharp intake of her breath.

Warren looked at her quickly. "Why, do you know him?"

"Yes. He is Gurra's brother. Oh Warren, don't go down there now," she implored as she saw that he was putting on his coat. "I'm afraid that those Plutonian murderers are just waiting for a chance to take you unaware."

Even as she spoke a startling thing happened. They had walked to the broad window of the laboratory, which commanded the street, to watch the mob outside attempting to push past the perspiring Vigilantes. Wass Dorn's sharp eyes pierced through the crowd to where Dakku was wildly waving his arms to a feverish group around him. When he saw Warren at the window he raised his arm quickly and pointed right

at him. Well it was that Wass Dorn suspiciously searched the dark alley behind the fanatic Plutonian. He saw an intensive flash of concentrated red light and at once hurled the surprised Warren and Nita to the floor, where he himself dropped as he shouted:

"Stay down. A flame-knife."

And as the three glanced up apprehensively at the window above them, they saw the glass and the metal casement grow white hot as the flame bit through and converted the solid substance into a hot, gaseous vapor. There was a tumult outside; the shouting of many voices and the rushing of feet as the Vigilantes, seeing what had happened, drove the crowd relentlessly before them. But the Plutonians had escaped in the confusion and hurriedly took off in their waiting space-ship.

The three rose from the floor. Warren was red with anger as was Dorn, but Nita's beautiful face had become as pale as death. Not for herself she feared, but for Warren. Her voice was far from steady when she said sternly,

"You must never take such chances again. I had a premonition that something was about to happen," then she looked at him tenderly, "You will need a body guard from now on. Not every one appreciates the fine work you are doing."

Warren nodded his head but said nothing. He was already engrossed in the problem of building the new electronic ionization apparatus for use on the earth.

But in those busy days that followed, while the Earthmen and the Earth Rehabilitation Commission labored incessantly to prepare for their work on earth, the political haze became thicker. They first heard about it when the Tycoon of Pluto, Jerili, issued a manifesto, threatening to withdraw from the Federation of the Universe, unless Gurra

was released and Warren tried in their courts. The huge dark planet Thor, one billion miles beyond Pluto allied itself with its sister planet and defied the Federation.

While all of this bickering was going on, the scientists completed their stupendous task. Huge machines, disassembled for shipment, were loaded on five large space ships at the disposal of the "E. R., Cons.," delicate instruments and laboratory apparatus were carefully packed and a group of mechanics were recruited.

Nita was too busy with her duties to think very much of the dangers they might have to face. It was her job to make certain that the entire personnel going on the expedition was absolutely loyal. She studied their records on file at the Central Personnel Bureau which were communiographed to her from planet A7-TY, and made personal inquiries through reliable channels.

The morning of the start of the expedition dawned grey and misty, but the sombre mood of the sky could not daunt the five hundred men and women who were about to embark upon a venture more stupendous than any yet undertaken by the super-civilized universe. Their mission was epoch making; if it succeeded it was to mark a new day in the history of man. For the first time since the worlds had been evolved from nebulae, science was about to remold the very nature of the human being. Not through mental development was this metamorphosis made possible of that intangible thing, called the soul. Unfortunately the material progress of mankind had leaped far ahead of the mental and spiritual. Men still lied and cheated and murdered one another, though they had spanned the gulf between worlds and had constructed marvels of metals and evolved miracles from matter.

Gayly and with a holiday atmosphere the five hundred filed through the doors of the five space ships that were resting on inclined ways at the main landing-field of the sky-city. Warren with Nita by his side stood on a raised platform in the centre of the field and proudly watched the embarkation. He was supreme in command; upon his executive skill would depend the success of the venture. He must not fail them.

"They are giving the 'ready' signal, Warren," Nita cried.

The commander of the expedition touched a button and the shrill whir of a siren rent the air. The air-lock doors of the four space ships clanked shut. After one sweeping glance that assured them that everything was in readiness the two descended from the platform and walked rapidly toward their flagship, the new *Earthbound*. Gurra's ship had been returned to its hangar, to be claimed by its owner or heirs, following his trial.

In the control room with Ross and Palmer, Warren at once switched on the communiograph:

"All ready. We will take off first; ship No. 1 is to go next, followed by numbers two, three and four at half minute intervals. Keep in constant touch with the *Earthbound*; and turning to Palmer he said quietly, "Let her go."

The rockets roared out their fiery blast and they were on their way to their home planet once again. One by one the other ships rose swiftly and majestically and set their courses after the fast receding flagship.

Ross Griffin had perfected navigation instruments that would enable them to determine their impending position on the earth with absolute accuracy, as soon as they came within five hundred miles of the planet's surface. Thus they were able to land on the plateau in northern

New Jersey, where they were to establish their headquarters.

TO the new members of the expedition the frozen landscape must have presented a bleak aspect. But they were uncomplaining although the bitter cold penetrated the heated suits and chilled the blood of those who had come from the torrid planets. As soon as he stepped from his flagship, Warren hastened to the mouth of the tunnel to notify his friends the Bear-Men of his return.

Down in the caves a chaotic condition met his eyes. Fragments of rock littered the floors of the deserted chambers, pungent vapors steamed unchecked from large fissures, copper implements and other furnishings were strewn about and were battered and broken. With a sinking heart Warren ran from cave to cave. The luminescent material with which the ceilings had been painted now emitted but a feeble glow, hardly enough to guide his footsteps so he had to flash on his illuminator.

In the dining hall where Warren and Ross had sat down to their first bite of food after hours of wandering at the bottom of the crevasse, he stumbled over something soft and yielding. He recoiled in horror. It was the headless body of a Bear-Man!

He nerved himself to bend down and examine it more closely. The neck was seared like the cuts on the bodies of Professor Ru Va and his men. There was no doubt in his mind, this man too, had been beheaded by the use of a Plutonian flame-knife!

Then he found more bodies, some fifty in all. Although almost nauseated by his gruesome task, he forced himself to examine every one of them in the hope of finding any who might through some miracle be alive. It was a good thing that he did for near the pas-

sageway that led outside to the crevasse he stumbled over a Bear-Man lying face down. Warren bent over; he found the head firmly fixed and the body still warm.

Hurriedly he turned him over and peered into his face. It was the Chief of the Three Ancients! Pressing his ear against the man's chest he heard the faint beatings of his heart. Somehow the old man had escaped the slaughter for there was no sign of a wound on him. He had apparently struggled to leave the cave and had been overcome by the fumes of sulphur dioxide, but fortunately he had been able to crawl to where the fresh air had reached him and kept a spark of life in his old body.

Warren picked him up carefully and carried him out through the passageway to the bottom of the crevasse. Although he administered artificial respiration he was unable to revive him. Then he thought of the healing power of his Super-Atmosphere gas. Quickly throwing the old man's bony body over his shoulder, Warren staggered up through the dark passage until he reached the exit on the plateau. He was thoroughly exhausted and was compelled to lay his burden down. To signal to his men he fired a blast from his gun and was relieved when he saw them hurrying to his aid.

"Here, take this man back to my ship. Never mind staring at him, it is the Chief of the Bear-Men," he said sharply. "The others are down below there dead, murdered."

Back on the ship they rushed the Bear-Man into a small gas-tight cabin where Warren turned on a tank of Super-Atmosphere gas and carefully watched his instruments, while the substance hissed from the nozzle. For many minutes the white-haired old man lay still, then slowly his chest began to rise

and fall as the life-giving gas was forced into his lungs.

He stirred restlessly, and groaned. Then his eyelids began to flicker. Warren and his companions watched with sympathy the old man's struggle for life. But the potency of Super-Atmosphere was again demonstrated. As Warren bent down, to better understand the old man's low mutterings, he heard him repeat over and over again the words, "Council chamber, council chamber . . . go . . ."

"Do you mean there is someone in the main council chamber who may still be alive?" Warren asked incredulously.

The Chief of the Three Ancients nodded in affirmation and began talking in a feeble voice:

"Yes, some of my people . . . trapped down there . . . perhaps they are alive . . . please go . . ." and his voice trailed off into incoherent mutterings.

## CHAPTER XIV

GIVING some hasty orders for the care of the old man, Warren called Ross and Palmer, and with a group of mechanics they hurried to the caves. The beams of the powerful rhodium illuminator lit up the ghastly scene in the cave where the slaughtered men lay. The group breathed sighs of relief when Warren passed swiftly on and led them down through the passage to the main council chamber. As they expected, the entrance to this cave had been blocked by a veritable landslide of solid rock.

"Stand back, everyone," Warren commanded. "Now, Palmer, aim the fireball gun at this spot," he tapped a place that sounded more vulnerable than any other, then stepping back out of danger he cried, "Let it go!"

Palmer turned a dial on the gun and clicked a lever. The white glare of

the rhomiums changed to blood red instantly as the ball of fire left the gun. No larger than an orange at first, the projectile sped toward the rock, expanding in size, until it measured fully six feet in diameter. The intense heat from it made the place almost unbearable and the men, although they were fifty feet away, suffered in spite of the protection offered by their insulating suits and helmets. When the fire-ball struck the rock there was a shower of sparks; the solid granite began to flow like water, and the viscous fluid changed into vapor as the temperature of the ball increased beyond white heat.

Warren was watching closely through the indicatroscope by means of which the effect of the fire ball and the depth of its penetration could be measured.

"That's enough, Palmer," he shouted, "Turn on the neutralizer."

As X. Palmer rapidly pulled levers and turned dials on the fire-ball gun, the white glow of the projectile changed to yellow, then to red, and in a few more seconds it disappeared entirely. Now they could see what had been accomplished; a circular hole, almost eight feet in diameter, had been melted through the wall of hard rock.

"They are moving in there! They are alive," the men shouted triumphantly.

"The rock over there is still red hot. I hope that they don't try to rush out yet," Ross said anxiously.

"I'll warn them against it," Warren replied and rushed in, as close to the breach as he dared. He shouted through the opening for them to be patient for a few more minutes.

It was a pitiful sight to see these people, their white fur streaked and gray and molted, their flesh wasted and drawn tightly upon their bones, with sunken cheeks and hollow eyes, stagger unsteadily through the opening. And there were many who did not come out, for

the foul air and starvation had taken toll of hundreds.

It was a task of the first magnitude to attend to those still alive, to feed them and build them up from living skeletons to strong healthy individuals. Warren assigned Nita to this work, where her sympathetic understanding and her efficient management endeared her in the hearts of these inhabitants of the earth. After two weeks of good food and regular treatments with Super-Atmosphere gas they had regained their strength and morale and were able to resume their work at the point where they had been interrupted. But they could never forget the loss of their friends and members of their families, and never forget the black devils who had brought all this suffering upon them.

The Chief of the Three Ancients, when he was fully recovered, told a gruesome story. One day, when the majority of the Bear-Men were attending a religious ceremony in the main council chamber, a horde of Plutonians suddenly swarmed down into the caves, dealing death with their terrible flame-knives to all who stood in their way. When they had murdered everyone whom they found in the upper caves, they blasted the rocks above the entrance of the Council Chamber, sealing it up and leaving the thousands within to a slow lingering death from starvation and suffocation. Then they released Gurra and flew off to Pluto.

"With Gurra stirring up mischief we are bound to be in for trouble," Warren remarked to his department heads who met to discuss the plans of procedure. "From now on we will have to post guards and watch the skies carefully for any strange ships."

But in the busy days that followed, Gurra and his associates were forgotten by all but those appointed for sentry duty. Sheets of Zistite were unloaded

and soon three huge laboratory buildings were ready to house the equipment. It was necessary to make the buildings airtight and insulate them, so that the men could work inside without having to wear breathing helmets and heated suits. Thanks to the wonderful properties of this metal, it was possible to gain the non-conducting advantage of cork walls ten feet thick by using thin sheets of Zistite, so that artificial air could be maintained at an even temperature within.

When all the equipment had been brought inside, the air-lock doors were installed, the conditioned air was turned on and the scientists began their real task of manufacturing the immense volume of Super-Atmosphere that would be needed to supply the planet.

In one corner of a laboratory building Warren located his office. It was scantily furnished. The walls were covered with charts on which he recorded the progress of the work; there were meters to show him the temperature of the various strata of atmosphere, the pressure of the air, and the volume of gases passed out through the huge pipes after the Super-Atmosphere had been mixed in the right proportion with the oxygen and nitrogen of the air.

Warren was sitting at his desk making some involved calculations. He turned to his communiograph operator and said:

"Harry, ask all my department heads to come into the office at once."

"Yes, sir," the man answered as he switched on the short range system and called all stations.

Within a few minutes Nita, Ross, X. Palmer, Wass Dorn and ten scientists of the "Earth Rehabilitators Commission" filed into the room and sat down around the conference table. Then Warren began to outline the work remaining to be done.

"All equipment in the laboratories has been set up and tested. We are now ready to manufacture one billion tons of Super-Atmosphere by means of Gordon Bancroft's process. Thanks to your ingenuity you have developed apparatus that will enable us to do this job in a little less than one earth year. Under the original plans it would have been the task of a life time.

"As you know, Gordonium, the new gas in Super-Atmosphere is manufactured by breaking down the atomic structure of oxygen by means of 'Q' rays generated by our apparatus. The wave-energy is sent into the atom which causes the electrons to be transferred from one quantum orbit to another. After this process the electrons and protons are synthesized again and we have a new element which we have named Gordonium. Before it can be breathed by men and animals it must be combined in a ratio of one part Gordonium to one million parts of the gas mixture we call air.

"Now the other part of this stupendous task of rehabilitating the earth is to restore or bring down its original atmosphere which is of course necessary as it will still constitute the largest part of the air that we breathe. You recall that when the earth's atmosphere was drawn away from the surface of the planet it was transformed into millions of tiny, gaseous satellites which revolve around the globe like a hollow sphere, totally encasing us.

"We are going up there in four space ships, to break up those satellites and bring those billions of tons of air down here where it will do some good!"

Although all his listeners knew in what manner all this was to be accomplished, still they were electrified by the images conjured in their minds by Warren's words.

After pausing for a moment he con-



tinued his recapitulation of the plans.

"Space ships Nos. 1, 2, 3 and 4 are equipped with electrical generators and special apparatus for charging the electrons of the oxygen and nitrogen atoms with positive instead of negative electricity, or in other words ionize them. Then by setting up plates here on the surface which we will charge with negative electricity the atoms (now unbalanced by the strong positive charge) will be drawn down by the attraction of the plates.

"As these atoms drop below the energizing rays sent out by your ships they will lose the positive charges from their electrons, but by that time they will have come within the gravitational influence of the earth, upon which they will settle by their own weight. Thus the normal atmosphere will be restored to earth, while a part of the oxygen will be converted into Gordonium as I mentioned before.

"Now we come down to the real purpose of this conference, which is to select the personnel to go aloft and those who are to remain."

All members of the group drew up their chairs more closely to the long table and began selecting the men. Warren was to remain at the laboratories with two hundred people, while each of the four ships were to go up manned by seventy-five technicians. Ross Griffin was to have general charge of the air forces, using No. 1 as his flagship. The *Earthbound* was to remain on the ground for emergency use.

## CHAPTER XV

THE following morning the quietness of the air on the bleak plateau was rent by the thunder of rocket tubes as the four large space ships rose simultaneously and whisked

out of sight. Warren and Nita watched the silver-grey shapes on the television screen. They rose steadily until they reached the atmosphere shell, where they shut off the propulsion motors and remained suspended.

The communiograph signal in the ground station began to hum. Ross Griffin's voice issued:

"Are we in position, Warren? It looks good to us up here."

Warren energized the direction indicator and read the dial.

"Your height is correct, but you are about one hundred and fifty miles east of us. Follow this guiding beam and I will lead you to your position."

There was a sharp whirring sound as the guiding beam generator was turned on. As Warren slowly swung the beam in the proper direction, he and Nita watched the four ships move across the screen as they followed the guiding ray.

"All right, Ross, anchor there. We are ready with our negative plates down here. How soon will you begin ionization?"

"Within an hour. I'll call you then."

When Ross called again fifty minutes later it was dark outside. The fitful light of the sun had waned and the landscape changed from icy grey to impenetrable black. Warren glanced at the meters on the switchboard in front of him and then pressed a series of buttons which threw in the remote control switches for starting the machinery. From the farthest building which housed the heavy generators, there came a low rumble as the machinery began to turn. Then, as the automatic rheostats operated to cut out the resistances, the generators revolved faster until the solid ground of ice under them vibrated in synchronism.

Nita was standing beside Warren, watching the needle on the voltmeter

swing rapidly upward over the dial.

"Ninety billion volts! Why, that's more powerful than a bolt of lightning."

"Yes, and it is far more dangerous unless carefully handled. We must make sure that there is no one within the enclosure."

Warren referred to the fenced-in area within which the huge copper plates that were to transmit the negative charges from the generators had been installed. These plates rested on high tension insulators, with a special insulating blanket between them and the ground.

Warren called all parts of the laboratory and the grounds and did not connect the high potential energy until he was assured that every one was well out of range.

"Watch through the window, Nita," he commanded tersely as he snapped the last switch.

At first everything was pitch dark outside. Then suddenly it seemed that pent-up lightning of a thousand centuries broke loose. From the sheets of copper a mile away streaks of electrical fire flashed up to the heavens. The whirring of the generators was drowned out by a crescendo of thunder. The whole world seemed to belch forth flames and roar as if in an agony of torture. The yellow tongues of fire whipped around the laboratory buildings, charging the hair on every one's head until they resembled human bristle brushes.

Nita grasped Warren's hand tremulously, only to be reassured by his firm grip.

"We expected something like this, but to tell the truth our imaginations were unequal to the task of picturing all these fireworks . . . Hello, what's that?" he asked as an excited voice

came from the speaker of the long-range communiograph.

"WARREN, Warren, ship number three is falling! Stop her! Shut off the generators." It was Ross Grif-fin. "She's caught in a whirlpool of force rays and can't get free."

Warren's heart skipped a beat as he whirled toward the televisor. He tuned the instrument frantically. There on the luminescent screen were three space ships suspended majestically in the air, while the fourth was spinning end on end headlong for the earth. The chief of the "Earth Rehabilitators, Cons." stood looking at the impending catastrophe as if he were rooted to the spot. Then, tearing himself away from the terrible fascination of the picture, he leaped for the switches to disconnect the energy from the copper plates.

"Ship number three, this is Bancroft calling. The atomic attraction has been disconnected on earth. Fire a heavy blast from your stern rocket tubes and head her up again," he shouted into the transmitter and found his eyes irresistibly drawn to the plunging ship upon the screen.

"What if they didn't hear you, Warren?" the girl asked tremulously. "Is there no other way to stop them?"

"I'm afraid not . . . Look, look! They heard me—there go the rocket blasts . . . Now she has stopped spinning—they shoot upward, on an even keel. Here, let me follow them. Yes, thank God, they are under control."

Warren was frantically turning the focusing dial of the instrument in his effort to keep the fast-moving ship in the field of vision. Then from the receiver came the welcome sound of Wass Dorn's voice, somewhat shaky, yet relieved:

"Space ship number three, Mr. Ban-

croft. We followed your orders and have rocketed to safety."

"Wass, my heart just couldn't stand another strain like that. Tell me how it happened."

"The Chief Technician reports that the quartz tube of the ionization apparatus burned out, and before he could replace it we were caught helpless and unshielded between the rays from the other ships and the ground station. It was terrible up here for a while; our insides are still floating around trying to regain their equilibrium. How can we avoid having such a thing happen again?" he asked.

Warren did not answer at once. He pulled out a drawer of his file cabinet and extracted a blue print. The drawing showed the maze of wiring and the many pieces of complicated apparatus which went to make up the involved ionization circuits installed on board of the space ships. He studied the drawing for a while and finally took a red pencil and drew some lines on it.

"Hello, Wass. I want to get Ross in on this, too."

Ross answered, whereupon Warren outlined to them the wiring changes that had to be made in order to provide for cutting a spare quartz tube into the circuit automatically in the event of the first one failing. He placed the blue print in the field of the television transmitter and pointed out the necessary modifications.

The work of adding the emergency circuit took the remainder of the night, and it was not until the next morning that the ionization could again be started. In the gray daylight the electrical pyrotechnics that took place when the copper plates were energized did not seem so weird, but the thunder reverberated just as loudly and rumbled through the frozen world.

IT required a full month before all of the difficulties were ironed out and the work of pulling the earth's atmosphere down to the surface could be completed, as well as the more gigantic task of manufacturing the vast quantities of Gordonium, could be placed on a full production basis.

During those busy weeks, when nerves were on an edge, when the great experiment seemed doomed to failure a hundred times for one reason after another, Warren and Nita had but little time for each other. For days they did not even meet. But personal inclination could not be allowed to interfere with pushing along the epoch-making task that the "Earth Rehabilitators" had set themselves to accomplish.

But now that the work was running along smoothly, they took long walks over the icy terrain, encumbered as they were by their clumsy garments and ridiculous helmets. As yet the effects of the thousands of tons of new atmosphere that had been added to the rarefied air near the surface of the earth could not be felt, but the delicate instruments in Bancroft's office had registered the changes positively.

For example, the average temperature for that time of the year had been raised four degrees. This was a most welcome sign, for it indicated that the feeble rays of the sun were warming the more densely packed particles of air. It was only a question of time before the great ice sheet, hundreds and even thousands of feet thick, would begin to melt. Only a question of time before man would be benefited by the wonderful effects produced by living with Super-Atmosphere.

So thought Warren and Nita when they were alone and had time for those dreams which lovers dream, as they sit looking into space with misty eyes.

The watch detail had been constantly alert for any signs of a hostile fleet. They searched the skies carefully through the televisior and listened intently to catch any strata messages. But there was no sign of Gurra. Information from Saturn and other planets of the system disclosed no hint that any movement was on foot that might endanger the "Earth Rehabilitators." One thing, however, was significant and ominous: there was never a message from Pluto or from her dark sister planet Thor. While the inhabited worlds of the solar systems were keenly interested in the progress of the work on earth, these two planets had shown by their silence their sullen resentment against Warren.

## CHAPTER XVI

SIX months went by. Steadily night and day the four space ships above continued sending down oxygen and nitrogen and the laboratories poured out thousands of tons of the Super-Atmosphere mixture. For a long time the results were not detectable except by means of the accurate instruments in Warren's office. Then gradually the disc of the sun could be clearly defined and blood-red through the haze of the upper atmosphere as the intervening gaseous satellites were being thinned out. The temperature rose slowly but surely, and with the coming of the summer season to this region the surface of the solid ice became slushy, and little rivulets began to trickle down from the plateau. The laboratory buildings settled lower as the ice melted under their foundations.

Warren made several observation trips in the *Earthbound* and found that the ice had disappeared almost completely in the regions around the equator. He even detected patches of

green where seeds of vegetation, long dormant, had taken root and were sprouting. But search as he would through the magnivisor, he could find no trace of living creatures. From all indications the Bear Men of northern New Jersey were the only members of the animal kingdom who had been able to survive the thousands of years of ice age.

So gradually that it hardly was noticeable, the color of the sunlight, as it illuminated the gaseous particles of the atmosphere, changed from grey and white to a rose-tinted hue. This was the color value imparted by Gordonium, the new element in the atmosphere. Viewed through this filter of tinted air, the colors of all familiar objects were modified. The Bear-Men were the first to notice this. When the air had become dense enough for them to breathe it freely up on the plateau, they swarmed out of their caves to behold the wonders of the new world. They rubbed their eyes and looked bewildered. When Warren tried to explain the reason for this phenomenon they nodded their heads as if they understood but still were confused.

It was Ross Griffin who first picked up the cryptic message. He was listening to the long-range communiograph in the control room of ship No. 1, when out of the air came these portentous words:

"Thor fleet ready to proceed. Signal for start . . ."

The remainder of the message was lost in garbled, unintelligible syllables. Evidently the sender of the message had just discovered that the speech inverter<sup>1</sup> had not been cut into the circuit and he hurriedly connected it. Ross

<sup>1</sup>A secrecy device which by suitable modulation and filtering processes, inverts the entire speech frequency band which turns the bass into treble and the treble into bass. The result is to make any language sound like some outlandish foreign tongue. A second inversion at the receiving end puts it back into its original form.

snapped on the secrecy translator and twisted a series of dials, but could not unscramble the message until its very end. But the single phrase he heard was significant and bore out his suspicion as, into the control room, in the screeching dialect of the inhabitants of Thor came the ominous words:

" . . . to Earth!"

Immediately he flashed Warren.

"Hello, Warren, this is Ross. I just intercepted a message between Thor and Pluto. I got the first part, but they scrambled the rest and I could not decipher it until the end. Warren, what we have feared all these months is about to happen; they are launching a fleet against us."

It was a lucky thing that you were listening in, Warren replied. "We had just relieved operators down here and disconnected the long-range set for a moment. I'll get in touch with Saturn at once and find out what they know about it. I'll call you back. Meanwhile instruct all ships to listen closely for any other messages."

Warren called Saturn personally. He did not want his operator to leave his post for an instant. But his office there could tell him nothing. They had been in constant communication with all planets, including headquarters on planet A7-TY, but if any preparations had been made on Pluto and Thor the secret had been well kept. It was true that diplomatic relations between those two planets and the remainder of the inhabitable worlds were strained, but even now the Body of Five Hundred was negotiating to relieve the tension.

THERE came a day when the last of the ice had melted and the water trickled down into the gorge where the Bear-Men had their caves. Soon the rivulet at the bottom of the crevasse became a raging torrent and

the white-furred Earthmen were forced to abandon their underground dwellings. This they were glad to do after they discovered the joys of living in the sunlight. With the help of the expedition members they began to erect little cottages from field stones that had been worn smooth by the action of the ice. Down in the valley they plowed the good rich loam with tractors that Warren had brought, and the first crop was planted upon the restored land.

It seemed perfectly normal to everyone that anger no longer swelled in the breasts of men nor did their eyes shine with the fire of hate. There was born a new happiness on all faces, a love for one another that was genuine and devoid of hypocrisy. Warren's dream of a new age was being fulfilled—a dream born in the mind of his great ancestor Gordon—rejuvenated after having lain in a sepluchre of ice these many centuries.

Walking abroad in the land Warren and Nita were happy. Even the menace of an invasion seemed remote and almost impossible in the new scheme of things. To them it was the Renaissance, the beginning of an era from which time would be reckoned in the future. Thus men walked upon earth, each engrossed in his dreams, seeing new things, thinking new thoughts, and they found that life was good.

The work of rehabilitation went on. The ships operated their ionization apparatus and the laboratory maintained its scheduled output of Super-Atmosphere. For a time there was some little excitement when four huge space ships bringing a thousand new settlers hove into view. These people were sent to other regions of the earth to begin colonizing there.

Warren and Nita watched with interest the transformation that took

place when these newcomers stepped out into the rose-tinted air of the planet that was to be their home in the real sense of the word. Petty grievances which they had intended to air immediately upon landing were somehow forgotten. They looked at one another with a strange, questioning light in their eyes, and, as the good air coursed through their lungs and affected their blood stream, a new understanding was born within them.

Exactly eleven months after they had begun the task of restoring the earth's atmosphere came word from Mars that a large fleet of strange ships had been picked up in their spectravisor. As the televisor revealed nothing, the Martians concluded that the ships were painted with a substance so that they could not be detected or seen by means of ordinary vision rays.

Warren was down in the valley supervising the erection of a power plant when he was called to the communiograph.

"A message from Mars for you, Mr. Bancroft," the operator informed him. "They picked up the radiation from a large fleet of ships headed for earth. They counted thirty-two of them."

Warren left the power plant at once and hurried back to his laboratory. He called up the four space ships aloft, and had a long conversation with their captains. At first he thought of summoning them to land at once and utilize the elaborate defensive system that they had devised, but suddenly a more spectacular plan struck him and he uttered a shout of triumph.

"I've got it! Stay up there. Here's what we'll do." And in short, staccato words he gave the others the details of the daring new plan, leaving them with the parting injunction:

"Now it's up to you fellows. It seems to be our only chance. It's either

that, or . . . ." And he left the words unfinished, but they knew full well what he meant.

No sooner had he finished speaking to the ships than he summoned all his department heads from the laboratories. Hurriedly he gave them curt orders and then personally inspected the apparatus he planned to use, looked over the rhodium illuminators, tested the fire-ball guns and did a thousand and one things to make sure that the new inhabitants of earth would be ready to defend themselves against the black hordes of Pluto and Thor.

But as he went about the task of preparing for war he felt strangely peaceful. He was surprised to find that he did not feel the old bitterness against his enemies that had in the past driven him into an uncontrollable rage. Indeed, now there was a smile upon his lips; he whistled snatches from merry tunes. Somehow the menace was unreal; to him it was something that would be dissipated without bloodshed or even ill-feeling.

When all was in readiness he waited. Reports were sent to him every few minutes, but as yet the fleet had not been sighted. Warren suspected that they would have to rely upon the naked eye to see the ships, as they did not possess a spectravisor—an instrument developed in that period. It was similar to a spectroscope in its action, by means of which an object emitting atomic light rays could be detected at great distances.

The communiograph buzzed with the calling signal from space ship No. 1.

"Yes, Ross," Warren acknowledged.

"A fleet of ships has just hove into sight."

"How many are there?"

"I can't see them all yet, but we've counted twenty-two so far, and there are others coming up faster than we



can keep track of them. Now they have surrounded us. Shall we let them have it?" Ross was getting impatient.

"Wait; not yet. I want to warn them first."

WARREN switched off the secrecy device and spoke to the invisible fleet far above him:

"This is Bancroft, representing the Body of Five Hundred on planet earth. What is your purpose?"

Down in the laboratory a group of scientists and technicians listened tensely for an answer. But the grim fleet was silent. Either they had not heard or had chosen to ignore Warren's challenge. Again he queried them, but still no reply. Then he heard the voice of Ross, trembling with suppressed anger.

"The devils! They have shot a fire-ball at us . . ." And the message ended abruptly.

On the television screen the watching group saw a ball of red fire spurt from an invisible gun on an invisible ship and head straight for ship No. 1. They clenched their fists and breathlessly watched while the attacked ship did an astonishing thing. Ross suddenly released the vessel from its immobility by firing a heavy blast from the rocket tubes. The vessel spurted forward like a stricken deer, not an instant too soon, as the fire-ball sailed harmlessly by the very spot where the ship had been a split second before. In the laboratory sighs of relief punctuated the tense silence.

"Ross, thank God you escaped," Warren said fervently. "Now give them hell, boys! You haven't a moment to lose."

He shouted the last part of this command, for he had already rushed to the switchboard and pushed a series of buttons to throw the full force of

the powerful generators into the negative plates outside.

Nita, true soldier that she was, stood tensely at the switchboard and operated the control handles, as Warren directed, until the meters registered a potential not far below the safety limits of the high-tension insulators.

"Do you think that they will break down?" she asked anxiously, peering out of the window as the flaming arc from the copper plates leaped skyward, higher than it had ever done before.

## CHAPTER XVII

UP in the space ships, the men in the control-rooms worked silently and grimly. Here the effects of the Super-Atmosphere had not been felt, and in the heart of every man was the unholy desire to dash this fleet of invaders to the ground and crush to a bloody pulp the black, ugly bodies of their attackers.

Warren had conceived the idea of defending his ships and laboratories by utilizing the very force that had almost resulted in catastrophe to space ship No. 3 when the ionization was first begun. He reasoned that if the ionization of the atoms in an element like oxygen could cause those atoms to be attracted to the plates on the ground, then the atoms composing the hull of a ship could likewise be energized in the same manner. This was what had actually happened when the quartz tube in the apparatus on No. 3 burned out and left the ship without its protective neutralizing forces.

As Ross gave the command to step-up the energy, he grimly watched the huge fleet of ships now visible through the observation window. Previous to this the Plutonians had been maneuvering to get into position to annihilate the ridiculously small force of defend-

ers. Now, when without warning the ionization rays were released, their ships were instantly frozen into immobility. Ross caught a glimpse of black faces, with frightened, protruding eyes, pushed against the windows, and then black mouths opened to shriek with fear as thirty-two ships plunged helplessly, out of control, straight for the surface of the earth! The speed of the falling vessels was tremendous; in a few seconds they would come within the pull of gravity and crash to the ground.

"Here they come, Warren, tumbling down a mile a second!" Ross shouted joyously.

"Shut off the positive charge," Warren commanded. "I'm going to ease them down gently."

"What? Have they gone mad?" Ross shouted incredulously to his friend. "Man, man, they'll pour out of the ships and just eat you up," he remonstrated.

But Warren only looked about in his laboratory at the group and smiled. They all nodded with understanding.

"Ross has forgotten that we have nothing to fear. He has forgotten that we have an infallible ally in Super-Atmosphere, that wonderful substance which will change the nature of man, erase his vicious tendencies. Look! There they are!" he cried.

**L**OOKING out of the window they saw them, the giant fleet of Plutonian ships. Out of the sky they came, black and portentous. So close together were they in the air that upon striking the ground they landed on top of one another as if they had been tossed into a pile by some mighty hand.

Then the watching group in the laboratory saw the air-lock doors opening. Was Warren correct in his assumption? Could Super-Atmosphere effect the

same changes upon all men, or were there some whose warlike, greedy nature would defy the influence of this substance. Warren was confident; the others, if they felt the least bit doubtful, did not voice their feelings. They merely watched.

Out of the door of the nearest ship they saw the black men tumble and mass around their vessel until hundreds had emerged. They came armed but had discarded their breathing helmets after seeing the Earthmen standing outside without that equipment. Intently the group in the laboratory followed the movements of the Plutonians; they saw them open their mouths instinctively and inhale the good air, and each man paused and looked wide-eyed at his neighbor. Their faces which were ugly by nature had been even more ferocious when they emerged from the ships. Now these same countenances lost their deep, harsh lines and of a sudden smoothed out into calm, peaceful expressions. It was gratifying and at the same time amusing to see them contemplate their weapons with a puzzled demeanor and then drop these instruments of murder as if they were burning hot.

"Let us go and meet them," Warren finally suggested.

At first they found the Plutonians shy, as if they were ashamed of their former fierce passion to slay these people who had established their new homes on the earth. Then gradually they lost their self-consciousness and mingled eagerly with Warren's men. As one ship after another disgorged its cargo of human beings, they went through the same cycle of dazzlement and wonder, then an awakening and finally culminating in friendly advances towards their former enemies.

Warren was happy. He sent one of his men to communiograph the good

news to the four ships aloft, with the request that they come down and join him. Among the densely packed throng of black men he searched in vain for a sign of Gurra. What had become of the leader of these invaders? The same question must have been running through Nita's mind, for she said:

"Warren, I feel just a wee bit frightened. These people have been transformed, but what about Gurra?"

Standing somewhat apart from the crowd, Warren and Rita were able to see over the heads of the others. Around one of the space ships which had landed on its side and after some difficulty had managed to open its airlock door, there were signs of commotion. A high-pitched, grating voice carried above the modulated tones of the others. There could be no mistaking that voice once it had been heard. It was Gurra!

Clad in a space suit and helmeted, he burst from his flagship, fighting mad. He shouted at his men, inciting them to attack these Earthlings. When his dull mind realized that his forces could not be moved by commands, he resorted to threats. But still they could not understand their leader's cries of, "Attack! Kill!" The taking of life had become an abominable thought to them, a horrible, barbarian cruelty that belonged to the savage past. Now it was out of the question; they could never again be forced to do it.

"Oh, look at that cowardly beast," Nita cried in alarm as Gurra pointed his flame-knife at one of his men and, without warning, severed his head from his body, where it rolled over and over on the steaming ground.

Warren sprang into action. He raced madly toward the black Gurra and shouted to the men who were standing aghast at what had happened:

"Rip off his helmet. He must be

made to breathe the new air, then he will understand."

Suddenly Gurra's men were galvanized into action. With a howl they sprang upon their leader and, although he kicked and fought and cursed, they tore the helmet from his head and stepped back out of reach of his sharp, clawing talons.

Warren waited, filled with a vague uneasiness. But the desired effect was not forthcoming. With a bellow of rage, Gurra leaped at his enemy. The man's short, horny arms caught the astonished Warren in a desperate, vise-like grip until the long, curved talons bit into his flesh like fingers of steel.

Warren's men rushed to help him, but with a single mighty blow with his fist the Earthman snapped the Plutonian's head back and the man released his hold and staggered away drunkenly. But he was far from being subdued.

Warren turned to his men. "This is something that could not be avoided," he panted, his voice indicating his keen disappointment. "We can now see that Super-Atmosphere has no effect upon some whose natures are warped and evil. In such cases there is only one thing to do."

And he advanced grimly upon the Plutonian, his eyes calm and steady, in contrast to the other man's half-crazed, bloodshot orbs. Warren had no thought of harming the man; he would subdue him and hold him captive where he could do no harm. But the wily Plutonian was not to be taken so easily.

Craftily he backed away, then turned suddenly as if to run. Warren sprang after him, but as he did so he found himself looking into the tube of a flame-knife. In that split second Warren thought fast. He must not falter or attempt to step aside, for the cruel weapon could sweep a spray of fire and fell him wherever he went. Instead,

he leaped and threw the full weight of his body upon the astonished black man and hurled him to the ground. Before Gurra knew what had happened Warren wrested the flame-knife from his claws and flung it far out of reach.

**I**N an instant Gurra was on his feet. But this time he did not attack. His weapon was gone and he was helpless. With a shriek and a back-flung glance he took to his heels and sped his short, gnarled body over the ground in the direction where Nita was standing. Fearing that he was intent upon taking revenge on the girl, Warren followed hard on his heels. The faster Warren ran the more desperately Gurra fled before him. Without doubt the man was mad with fear; he had lost all reason and sense of direction, for he did not see how close to the edge of the precipice he was.

Warren shouted a warning, but the fear-impelled man did not heed. Straight for the edge of the sheer drop he ran, and then, to the horror of the thousands who looked on helplessly, he leaped high up into the air and, waving his arms frantically, he disappeared from sight over the brink. Warren ran to where the crazed man had been just a moment before, and the sight he saw below sickened him so that he waved to Nita to stay away.

\* \* \* \* \*

From the Body of Five Hundred came a message telling Warren that a thousand space ships had left from near-by planets to help him in his fight against the outlaw Plutonians. But Warren speedily dispatched an answer,

telling them what had happened, and how the Earthmen had become reconciled with their former enemies.

It was only a few days later that he reported his gigantic task finished. All that remained now was to complete the colonization of the planet, to plant seeds in the ground, reap the harvest and live in peace with one another.

His final report was lengthy and in many portions technical. Warren had sat up late several nights preparing it. While his operator read the words over the communiograph, Warren took Nita by the arm and the two strolled to the laboratory window. It was evening, and the air was clear and still. The sun dipped below the horizon, sending its last rays through the red-tinted atmosphere and lighting up the new world from which sickness, hate, care and envy had been banished. As the full moon shone more brightly in the darkening sky, the operator droned his message to the rulers of the universe on a far distant planet.

When he finished, the communiograph was silent for a moment. Then came the reply:

"Day number 861, sidereal hour 7.25, interstellar period 25,439. This is the Central Communiograph Station located on planet A7-TY in the planetary system of Spica, the alpha star of Virgo. It is with profound gratitude that the Body of Five Hundred acknowledge the stupendous work completed by Warren Bancroft . . ."

But Warren and Nita did not hear any more. They drew closer together and looked with misty eyes over a new world—their home.

THE END

# The Martian Mail

By J. LEWIS BURTT, B.Sc.

*We know our readers will be pleased to read another story by this author who has long been a great favorite with them. We are really sorry that Mr. Burtt's stories have been crowded out of our magazine lately. We will not keep our readers waiting so long for the next story.*

WELL, what do you think of her, Joe?"

It was Captain Fredrickson of the new mail carrier *Marterra* of the Mars-Venus-Terra Corporation who spoke.

"Looks good to me," was Navigator Joe Carson's comment, "I hear these new motors are comet-shooters all right. Know anything about 'em, skipper?"

"Oh, I've a sort of general idea. Better ask Vac to show you over. He'll talk about 'em as long as you like—and longer. They're quite a new thing though. You know how the old cosmic-ray motors used to work, don't you? Well, these are something like that, but instead of using the ordinary cosmic rays they use that newly discovered ray that the newscasts will insist on calling the 'sub-etheric' ray.

"As a matter of fact it's not sub-etheric at all—whatever that may mean—it's really sub-electronic, caused by the energy release in the formation of sub-electrons.

"Anyway," he broke off, "let's go collect Mac and look 'em over."

Outwardly the new mail ship was very much like her predecessors. There was the usual tapering metal hull, triple skinned with vacua between the layers. Her fittings, navigating instru-

ments, passenger accommodation, etc., were all of standard types. Only in her engine-rooms was there a noticeable change, for, instead of using the common type of reaction motors, she was fully equipped with an entirely new type of propulsion.

You will remember the attempt that was made to make use of cosmic-ray propulsion before it was abandoned as impracticable. Well, here was a similar thing, but, instead of producing a *false* gravitational pull in the space ahead of the ship, they actually produced a *true* gravity by distorting space itself. Thus no fuel was required except for focussing the rays. All power after that was derived from space itself. For all practical purposes it might be regarded as perpetual power, though theoretically, of course, it was merely a transference of energy.

Just as the two officers turned to go in search of Chief Engineer Mackinnon, an orderly came up and saluted.

"President's compliments, sir," he recited. "He wishes to inform you that he will be traveling with you as far as Mars."

"Thought as much," was Fredrickson's comment, as the orderly disappeared, "The Old Man never yet missed going out on the first trip of a new type ship. Oh, well! He's not so bad

at that, even if he is president of the line."

"An old navigator himself isn't he?" questioned Carson.

"Yes. One of the old school too. Thinks any fool kid can navigate a ship these days, and doesn't mind saying so either."

A COUPLE of hours later the mail was slung aboard and the great valves of the *Marterra* closed. A few minutes later she lifted herself gently into the air.

For fifty-thousand feet she rose before her captain dared to use the power of the new motors. The disturbances would have been too dangerous otherwise.

For a minute or two she drifted there, then.

"Altitude, sir," called the Observation Officer.

Carson leaned over and pulled a lever. There was a piercing wail as the attention sirens sounded through the ship. Then he spoke into his microphone.

"All passengers, and all others not on duty, will lie down on their bunks and prepare for acceleration. This ship is fitted with exceptionally powerful motors and it will be dangerous for anyone to remain up during the acceleration," he warned.

The regulation five minutes elapsed. Then he pushed over the control to the ray motors. There was a jerk as though a comet had hit them. Then everything became normal again.

The president, who was seated in his padded chair alongside the captain, looked up.

"What's wrong? Motors blow out?"

"No, sir," replied the captain, "Look at the meters!"

The accelerometers showed an acceleration of over a hundred feet per second per second!"

"But—" gasped President Torrens in disbelief.

"It's all right, sir," interrupted the captain, "Did you forget that the pulling force is ahead of us, and so is pulling on every atom with equal force? That's why we don't feel the acceleration."

"Yes, I know that!" replied Torrens rather testily, "But what was that con-founded jerk?"

"Sorry, sir," chimed in Joe Carson, "I guess that was my fault. Not fully realizing the power we have, I set the ray-focussers a little too close to the ship and we got caught for a second in the edge of the space-vortex."

"Ease her down a bit, Joe," came the captain's voice, "I'd like to see how long a lag there is before the vortex disappears when the ray is dispersed again."

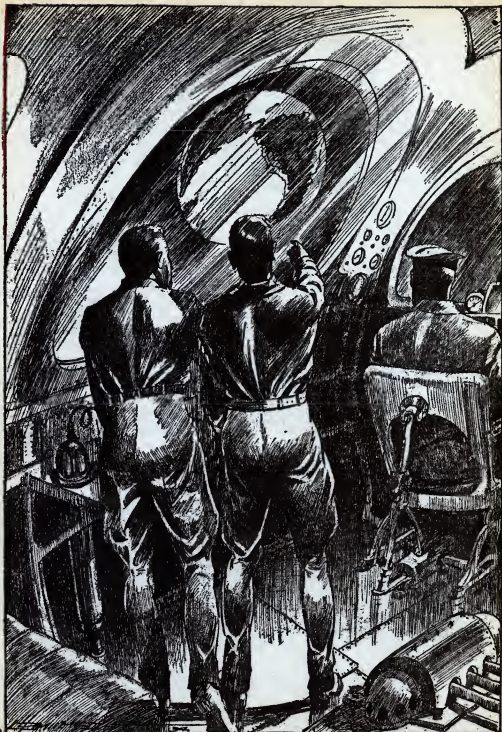
This time, as Carson shut off and re-applied the focussers (the ray was not *produced* by the motors, remember, but *collected* from space and *focussed* into a vortex) there was scarcely any jerk at all.

"Fine!" commented Frederickson, "Response is instantaneous. To tell the truth, I was a bit doubtful of that vortex. Seemed to me it might be easier to form than to break up. We're playing with big forces and—well, now that we *know*, let's go get a drink."

ONCE certain that the power vortex was smoothly formed and that no acceleration pressure would be felt, the captain released the passengers from their bunks. Before long, most of them were settled down in the great observation room, staring out at the alluring spectacle around them, a spectacle which never lost its charm even to seasoned space-travelers.

Behind them lay the immense ball of the earth, covering a great arc of the heavens. Above and to one side, ap-





*"Even now the change due to space is appreciable over a range of a million miles. Mac spotted it by noticing that earth appears a shade too close to correspond with our distance from Mars."*

peared the flaming disk of the sun himself. Only with special glasses dared they look at that flaming orb. It was a sight never seen from the earth. Out from the disk shot dazzling streamers of flame, reaching up thousands on thousands of miles into space, blue-white flames, yellow-red masses of blazing gas, forming the marvelous corona that our old astronomers only knew by means of a few vague and fleeting glimpses during eclipses.

Everywhere else the black, velvety sky was studded with innumerable points of light—infinately small—infinately dazzling—infinately still. The familiar constellations could be recognized, but only with difficulty, as the many millions of stars, invisible from the earth, confused the sight.

To one side lay a whitely-gleaming crescent—Venus, once named the "Star of Love," now known as a planet of dread, a prehistoric world infested with savage and dangerous forms of life, which were a constant menace to its peoples.

As the ship settled to her course, there appeared, almost, but not quite ahead, the little red disk that was to be the first port of call, the little planet still called Mars, though no longer the "War Star."

Strange it is that our world should have so misnamed its two neighbors, calling the dead Venus the "Love Star" and Mars, whose peoples are the most lovable and gentle in the Solar System, the "War Star."

The terrific acceleration continued for about two hours, during which time they gained a velocity of some hundred-and-fifty miles a second, and had traveled some half-a-million miles on their long trip.

Then, to the captain's surprise, Chief Mackinnon appeared in the control room, an unusual occurrence, since it

was much easier to call through by visophone.

Sensing trouble, Frederickson looked up at him.

"What's wrong, Mac?"

"I just want a word wi' ye in private, sir," he replied.

"Now, what is it?" was the captain's anxious query when they reached the private chart-room.

"It's that vortex—I—I'm afeared, skipper."

"Afraid, *you?*" The captain stared in amazement at this announcement.

"Well, I'm no so very easily scairt as ye well ken, but—Well, take a quiet bit sight on Mars and earth."

Puzzled, yet trusting in his old shipmate's proven judgment, Frederickson went back to the control room and did as Mackinnon suggested.

A few moments calculation, and then, with a low whistle, he looked at his engineer, a look that said "This is serious, but keep quiet."

Then he went to the panel and said to the navigator in a low voice:

"There's trouble, Joe. Ask Mac to explain. I'll take control for a while. Send the O. M. up here, will you?"

As Joe Carson slipped out of the control seat, the captain sounded the warning and then said quietly.

"Ladies and gentlemen, I must request you all to secure yourselves in seats or bunks. This is a new type of ship, as you know, and we wish to make some tests of manoeuvrability. The tests will commence in two minutes."

During this two minutes he explained rapidly to the president and to his senior officers just what had happened.

"I thought it best not to alarm the passengers, gentlemen, but our situation is serious. The space-vortex, despite the fact that our focussers have been reduced, is increasing in size and

intensity, as shown by our observations of the planets.

"When we first started we tested the response to control, as you are aware, and we got an instantaneous reaction. Now, however, there is not that response. It seems that the vortex has become more permanently established.

"I don't think there is any actual danger, but the Chief says we may have to use extremely drastic methods to break up the vortex.

"Even now the change due to space is appreciable over a range of a million miles. Mac spotted it by noticing that earth appears a shade too close to correspond with our distance from Mars.

"If we have trouble breaking it up, the passengers are in for a rough time, I'm afraid."

Then, turning to the engineer, he added, "Listen, Mac, I'm going to try various formations and dispersions of the rays, and I'd like you in personal charge of the motors. Can you manage that as well as checking observations on your panel?"

"Right," was the Chief's terse comment, followed by. "Want suggestions?"

"Sure, Mac," was the response, "Not only want 'em, but shall very likely need 'em."

FREDRICKSON had given the passengers their two minutes warning, but not one second longer. Then he reached out and put all motors and focussers into neutral.

After half a minute came the steady, disciplined voice of Joe Carson.

"Acceleration still a hundred and twenty. Vortex stationary." Then, before the captain could make a move, the observer continued, "Last observation incorrect. Vortex expanding slightly."

"How big?" was the captain's quick question.

"One and a quarter million miles over all, sir, with a nuclear swirl of ten-thousand," was the reply.

Instantly Frederickson made a series of adjustments, throwing a sphere of ray foci in a sort of lattice-work around the great vortex. At least that's the nearest description possible. Remember that these vortices and foci are four-dimensional phenomena, for which we have as yet no satisfactory language.

The idea was to throw a strain on the vortex and, by checking it in this way, cause it to break down and disperse.

As the new foci formed, all on board experienced a most peculiar sensation. There was no jolt, no jerk, no pressure, but everyone experienced a sense of strain, a feeling of being torn apart, a feeling that, while not exactly painful, was nevertheless most distressing. Of course, the two opposing forces were straining and distorting space, and all within range of the distortion came under the tension. Their bodies were experiencing the same distortion and the result was something quite impossible to describe.

"No good, sir," came Carson's voice. "The vortex is still expanding."

Then, from below, came the alarmed voice of MacKinnon.

"*Cut them out, sir! The big vortex is absorbing them!*" Then, after a few moments, "Try a general dispersion-broadcast without foci, sir."

But that was no use either. The vortex seemed to be entirely out of control now, as it rushed steadily towards Mars, dragging them in its wake.

Doggedly they tried combination after combination, but without result except, it seemed, to feed the ever-growing whirlpool.

Frederickson reached a hand up to the sirens, spoke through the microphones.

"Ladies and gentlemen, we can no

longer hide from you the fact that we are in grave danger. In front of us is an uncontrollable space-vortex which is dragging us with it, and, we fear, sucking us into its centre. Lifeboats and space-suits will be alike useless.

"We have not yet accepted disaster as inevitable and we still hope to smash the vortex, but you must be prepared for anything that may happen. We will warn you if the danger becomes more imminent."

The passengers took this bad news surprisingly well. There was no sign of panic—after all they knew, when they set out, that space-traveling is always dangerous—some tried to wear a mask of false cheerfulness, others continued in a sort of stoic calm, some few could be seen praying quietly.

Meanwhile the efforts of the officers continued. Nothing seemed to check the ever-growing vortex, but by skilful and careful maneuvering they were able to keep the *Marterra* on the outer fringe, so that the strains tending to crush or disrupt her were minimized.

But it soon appeared that they had, in releasing the vortex in the first place, started more trouble than even they could have believed possible. All at once Joe Carson called out to the captain,

"Come here a minute, sir, please."

The ominous import of this singular request caused Frederickson to jump from his chair and across to Carson in a single bound.

"WHAT?" he asked, for the first time allowing his anxiety to show.

"Look!" was the laconic reply.

What need of words? The instruments showed only too plainly that tragedy unbelievable was abroad.

To an experienced navigator like Frederickson, it needed no calculators

to tell him that something was wrong with the positions of the two planets Mars and earth.

"Check the instruments," came the anxious voice of the harrassed captain.

"They *are* checked, sir, and Mac's set corresponds exactly."

Frederickson turned to the 'phone.

"Mac, come up here right away," he called. Then, to the president, "Mr. Torrens, I'd like a conference in the chart-room." and then to Carson, "Sorry I'll have to leave you here at the panel, Joe, but you're too badly needed where you are. Keep your ear-phones tuned in on us though, and give us what observations you can to help us."

In the chart-room Frederickson looked at the other two men and, in silence, handed them each a paper with some figures on it.

Torrens looked at it for a minute. Then, in a strained voice, said, "But it means—!"

"Yes, sir, it means the destruction of two worlds if not more, unless we can break that vortex. Already the space between Earth and Mars is so twisted as to throw them out of their orbits. They are already swinging towards each other, and soon their own masses will be adding to the gravitational pull of the vortex itself."

"How long have we?" asked Torrens abruptly.

Without replying, both officers turned to calculating machines. After a few moments came the replies.

"About forty hours," from Frederickson.

"Eighteen hours," from Mackinnon.

"How come, Mac?" was Frederickson's surprised question.

"Ye figured that vortex would be expanding at constant speed did ye no? Well, it will not. It's already expanding with *increasing* speed!"

"Guess you're right too, Mac. Less

than a day to avert the destruction of the whole Solar System, for that's what it amounts to! Any ideas, sir?" the captain asked, turning to Torrens.

"No, Frederickson, I haven't," he replied tonelessly, "But perhaps some of the others have. Shall we tell all of them the awful truth and see if perhaps someone can suggest something?" he went on with a gleam of hopefulness.

"Pretty drastic, but I guess you're right," agreed the captain as he turned to the microphones.

But it was all to no purpose. Suggestions were offered, examined, tried out, but still that hellish vortex spun on, still the two worlds continued to swing further and further from their orbits and nearer and nearer to their doom.

IT was about three hours after the departure of the *Marterra* that the first warnings of calamity began to be heard on the earth. It so happened that one of the observers at the Dominion Observatory at Victoria, British Columbia, in setting the big reflector on a particular star, discovered a slight error of placing, an error greater than could be accounted for by inaccuracies in the exactly constructed instruments.

Wisely he called the Director, with the result that the presence of the immense space-vortex, with its effect on the orbits of the two planets, was soon detected.

Immediately the facts were radioed to the other great observatories and their confirmation obtained.

The danger to the two planets was very quickly discovered, but even before official warnings could be given to the world, warnings from Nature herself begun to be felt.

There seemed to be a curious feeling of tension noticeable by everyone. The weather all over the earth began to change. Within an hour or so the at-

mosphere was in a turmoil of raging, erratic storms, none of them exceedingly violent as yet, but sufficient to cause comment even before the warning messages were broadcast.

In an incredibly short time a radio hook-up was established among the leading astrophysicists of the world—there was obviously no time to call them together in person, especially as each needed to be at his own observatory—a hook-up that was also linked in with the world's chief governments.

Here, for the first time, was seen the immense value of such a network, the means for establishing which had been invented only a few years before.

For some time the scientists worked to discover the cause, effect of and possible cure for this threatened vortex. At their request, the speediest space-patrols, manned by volunteer crews who had been warned that they might be sent to their deaths, were held ready for instant service.

Some two hours after the first intimation that all was not well, the cause of the trouble was disclosed. One of the Parisian astronomers remembered the sailing of the *Marterra* with her mystery motors. He calculated her probable course and discovered that the vortex was in such a position as to make it obvious that she had something to do with it.

An urgent call to the M. V. T. Corporation confirmed the fact that the *Marterra* had motors designed to work by the establishment of just such vortices, and so the cause was definitely settled.

The remedy was, however, another matter. Was the *Marterra* holding that vortex in existence not knowing of or realizing the danger she was causing? Or was she out of control, trap-

ped and facing her end? In either case it was quite impossible to get to her in time, and, even if radio waves from the earth could reach through the Heavenside layer to her, it would be impossible to get any reply that way.

There was only one possibility. A powerful cruiser was sent out beyond the atmosphere with orders to use every means of getting into touch with her.

THE plan succeeded. Although it seemed quite useless, yet, in accordance with regulations, the *Marterra*, once the danger was realized, had started to send out a regular 'H M' call—the Interplanetary danger warning.

On getting a reply from the cruiser, she at once gave the details of the difficulty and of what means she had tried to avert the catastrophe, adding at the end, "Don't try to rescue us. We are beyond outside aid. Any ship approaching us will be trapped too. Our only hope is yours also—to find a means of breaking down this vortex."

By the time the message had been relayed by a fast scout-boat to the earth, the whole world had become aware of the peril. Small tidal waves had begun to appear. Slight, but definite, earthquake shocks had begun to make themselves felt. In all countries police forces were kept on extra duty, and militia and regular armies were called out to aid in case it became necessary to meet the emergencies of panic conditions.

Humanity was, however, curiously calm. The suddenness of the danger seemed to have stunned the people—which perhaps was just as well. At any rate, no riots or other disturbances developed. All seemed waiting—waiting for they knew not what. Probably very few really believed that such incredible disaster could ever come. So many warnings and prophecies of "the

end of the world" had proved false, that now it seemed only another cry of "Wolf!"

At the end of some seven or eight hours it had become obvious to the observers that the situation was desperate, and, even to the people at large, the danger was becoming more apparent.

In Europe, over which night had now fallen, the earthquake shocks, normally rare in that part of the world, had become more definite and frequent, while the little planet Mars, seen through the scudding stormclouds, shone with a brilliance that made it obvious to all that the distance between the worlds was rapidly decreasing.

Still the astronomers and physicists worked on. Plan after plan was suggested, calculated out—rejected. There seemed no possible way of averting the cataclysm. How could that great vortex, whose outer diameter was now over two million miles, be reached, let alone broken-up? *It was impossible!*

Nothing could be done from earth or from Mars, where similar consternation prevailed. The only real hope was that the little *Marterra* herself could break that gigantic whirl, and she had already tried every possible and impossible method.

Finally the Astronomical Council issued a bulletin that shook humanity to its depths.

"We are hopeless. All possible means of averting the destruction of our worlds have been tried without success. Unless some other possibility is discovered, the end will come in about ten hours.

"Human knowledge has failed to stop the calamity which itself has started, but we are still in the hand of God, and we shall continue to work on in the hope that He will yet give to us the inspiration that will show us the way out."



MEANWHILE on board the *Marterra* the struggle continued. All at once President Torrens looked up from a calculator he was working with.

"How long does it take a vortex to crystallize, Frederickson?"

"To 'crystallize'? What do you mean, sir?"

"I mean, just how long can a ray-focus be formed into a vortex before that vortex becomes stable and permanent? In other words, for how long can we produce a vortex and still be *certain* that it will collapse when we disperse the rays?"

"I haven't any idea, sir," replied Fredrickson, puzzled as to what Torrens was driving at. "Have you, Mac?"

Mackinnon simply shook his head. How *could* they know, when they'd never even thought of a vortex becoming permanent, not at least until the calamity had occurred.

But Joe Carson, after a moment's thought, turned to the navigator who had relieved him at the panel and asked.

"Have you the log?" and on receiving an affirmative reply, went on.

"When we started from earth, just how long was it from the first formation of the vortex until we dispersed it in that response-check we made?"

"Let's see, sir. You struck the focus at exactly seven minutes thirty-one seconds, and made the dispersion at eight minutes forty-four minutes six seconds, sir."

In interplanetary ships, official time was always reckoned from the moment of starting the voyage. All control variations were, of course recorded automatically by electrical means.

"A little over a minute," commented the president as he heard the figures, and for a short while he sat pondering. Then, suddenly, he exclaimed. "Jove, I

believe that test will be our salvation yet! I've got an idea! Listen!"

Carefully he explained his plan to the officers, ending with,

"Dare we try it, gentlemen?"

There was a short, tense silence, broken by Mackinnon.

"It's a forlorn hope at best, but it's our only chance to save the worlds. I vote we try it."

"You realize that it means certain death for us, don't you?" the president reminded him.

"Yes, sir," was Mackinnon's comment, "but we've got to go out anyway, and we may as well go fighting."

"Good! That makes it unanimous, doesn't it?" was Carson's agreement.

"I hate to tell the passengers, but,—here goes!" Fredrickson muttered to himself as he sounded the sirens once more.

"LADIES and gentlemen," came his voice when the wail of the sirens had ceased, "I think you are all prepared for this announcement. Unless this vortex is smashed within a very short time our worlds are doomed to perish, and we with them.

"We have a thousand-to-one chance of escaping ourselves. There is a very faint ghost of a chance by which we may yet break the vortex.

"To be frank with you, it is only one chance in a million, and,—" he paused, then went on impressively, "if we take that chance it mean *certain* death for ourselves.

"The officers of this ship have unanimously voted that we take the one chance in a million of saving the worlds, and forgo our own chance of living on. What is *your* verdict, ladies and gentlemen?"

Once again silence fell, a silence whose tenseness was terrible. Then a buzz of conversation broke out.

For several minutes the passengers discussed the fatal question, occasionally calling through to the captain to ask some information. Then a quiet voice came over the 'phones.

"Captain Fredrickson, as spokesman for the passengers and crew, it gives me pleasure to inform you that we concur in your decision *by a unanimous vote.*"

A decision, a sacrifice almost unique in history, which needs no comment from its narrator.

Immediately the captain turned to Torrens, saluted, and said:

"Will you take command, sir, please?"

"No captain, it's your ship," replied the president. "Just look on me as the pilot."

"O. K., sir."

"All right then," said Torrens, immediately taking charge as pilot, and issuing instructions as such, leaving Captain Fredrickson still in nominal command of his own ship, a courtesy that Fredrickson well knew how to appreciate. "First of all we must drag ourselves out of the rim of the vortex. Have Mac form a vortex astern of us with all the power he has—I think we can control things better from below than you can through the relays, don't you?—He must destroy this vortex within forty seconds of its formation and, immediately on its destruction, re-form it, repeating this process until we are far beyond the drag of the big swirl."

The jerk and strain, as this counter-vortex came into play, was almost unendurable, yet endure it they must. Space itself seemed to be torn asunder as by giant hands. The ship groaned and creaked, massive and powerful though it was. Its very substance seemed to be torn and distorted.

Every living being suffered torture, for, although no one was actually in-

jured, yet the distortion and strain on every atom of their bodies was almost unbearable. The continual forming and breaking up of the vortices made things much worse, too, as the strains were so irregular and jerky.

For several minutes there was little result. Then they began to find that the ship was gradually pulling clear of the great maelstrom.

After about fifteen minutes of this, *Marterra* at last won free and, a few minutes later, was well outside of the area of strain and drove rapidly away from the vortex, which continued its headlong path through space.

"What is the direction of spin of the big whirl?" asked Torrens now.

"Clockwise, in a plane about thirty degrees inclined positively to the elliptic and as nearly as we can tell, nearly normal to the zero plane of the fourth dimension," replied a young officer who had been working on this.

"O. K., lieutenant." Then turning back to Frederickson the president instructed:

"Let Mac form a permanent vortex opposite in rotation and direction to the big one. Get it moving so that it will converge on the other and strike it about the time they become equal in power."

The forming of this new vortex was an easy enough matter, but giving it the necessary motion through space, especially in the fourth dimension, was no easy job. However, Mackinnon succeeded in getting it to move roughly in the manner desired, before it became too big to influence. Once it was established, he drove it and fed it with all the power his focussing motors could give him. It must be built up to approximately the same power as the other before striking it, otherwise the neu-

tralization would be imperfect and the effect useless.

The two vortices, with the little space-ship, now formed an immense triangle of which the *Marterra* formed the apex, the base-line constantly decreasing as the two huge disturbances rushed together.

After a while Mackinnon called up.

"She's away, sir. We've done all we can, but whether they'll meet in time, what actually will happen when they do meet, is beyond me."

"I know, Mac," answered the president wearily—he had aged ten years in those few hectic hours—"there's nothing to do now but wait."

"Shall we tell the world what we've done?" asked Joe suddenly.

"Yes, Joe," replied Torrens, "give them that ray of hope at least."

THE counter-vortex was formed some four hours before the time calculated for the collision of the worlds. As soon as the astronomers were advised of it they began feverishly to observe and calculate its path.

Observation had by now become extremely difficult, both on account of the turbulent state of the atmosphere and on account of the distortion of space itself, a distortion now sufficient to twist the rays of light very considerably from their paths.

The great question now was whether the worlds would collide before the vortices met or not. Opinion differed. Some observers believed the calamity to be inevitable, others said that the vortices would meet in time to avoid it, while others again, and these constituted a decided majority, while calculating that the vortices would meet first, still contended that the shock produced by the interaction of the two great distortions would wreck the worlds even without actual collision.

And so the nations waited, hope alternating with terrified apathy. It was all so sudden, so incredible that none could really grasp the immensity of this man-made calamity.

The straining of the earth increased in violence. The destruction caused by earthquake and tidal-wave was appalling. All possible efforts had been made to remove the inhabitants from the coastal regions which were threatened by the raging oceans, but only a small fraction could be got away in time.

Roads and railways were crowded to capacity. In the air, numberless pilots battled heroically with the storm-racked atmosphere as they fought their way back and forth in trip after trip, until the air became so turbulent that not even the bravest and most skilful could continue.

The moon had already been drawn from her orbit and was now at least a million miles away from the earth—over four times her normal distance—and at that distance she appeared little larger than the rapidly approaching Mars, whose two tiny moons could now be seen with the aid of the simplest glasses.

Less than seven million miles now separated the two planets, the onrushing Mars growing ever brighter as she raced toward the compelling vortex.

She too was suffering, but not quite so terribly as the earth, as the vortex was nearer to the latter planet. Also the greater mass of the earth increased the strains there.

So hour by hour the worlds watched their fate rushing towards them. By now all knew that utter annihilation was almost inevitable, yet so buoyant and optimistic is man at heart, that none really believed that the end would actually come. There was scarcely a man or woman who gave way to despair. Fear, doubt, terror, shook them in ter-

rific waves of agony, yet still they clung to a blind, unreasoning faith that some way or other the world would yet be saved.

Only on the little *Marterra* was there hopelessness. Those on board that little ship *knew* that they had rejected forever what hope they might have had of life. Yet even they did not despair. For themselves they had *no* hope, but for their worlds they still hoped on, still believed their sacrifice would not be in vain.

The end was getting very close now. Only two million miles separated the tortured worlds. Less than half a million miles separated the two vortices, but the outcome was still doubtful. The worlds were rushing together with terrific velocity, in comparison with which the approach of the vortices seemed snail-like.

Suddenly Joe Carson pointed through one of the observation ports.

"Watch!" he called.

There, through the port could be seen earth's moon hurtling along on her mad journey. Approaching it from the direction of Mars came another sphere, in comparison a tiny one, yet still a mass big enough to constitute a world. Mars' little satellite, the outer one we call Deimos, was racing forward in its twisted orbit to meet our moon, their orbits almost touching, their own gravity pulling them together. Collision was inevitable!

Fascinated, the passengers and crew crowded to the ports, their own terrors and sufferings forgotten. Before their very eyes was being enacted a cosmic drama that would provide a spectacle seen only once in a millenium in the whole universe—the collision of two worlds.

Tiny, uninhabited worlds they were, little Deimos being only a few miles in diameter. That fact took the horror

out of the spectacle yet robbed it of none of its drama.

Their own peril forgotten, they watched the crushing worlds. Their speed of approach quickened. Like a skidding car the little Deimos swerved from its path and smashed full into the onrushing moon.

There was a soundless crash, a blaze of dazzling light as the two worlds became one and the new world continued its crazy career, a blazing disk of wondrous light.

Then came the reaction. So that was to be the end of the two big worlds! Or *was* it? For the first time the horror of the impending crash pierced the minds of these observers, shook their courage, their purpose.

The quiet voice of President Torrens came over the 'phones.

"Steady folks! There's still hope for *them*."

For a moment they rallied, took a new grip on themselves, forced their waning courage back into life. Then—

Space itself seemed to explode around them. There was an instant of tearing, racking torture, and then—oblivion!

AS the two vortices contacted they swung violently into each other. In an instant the two opposing maelstroms interlocked—neutralized each other. Space, which had been twisted and knotted in an unbelievable contraction, burst its bonds like a suddenly released spring.

The worlds, almost in the moment of collision, were flung apart as the space between them stretched out. One instant they were almost touching, the next they were thirty million miles apart.

The shock of release did almost fulfill the predictions of the astronomers. Only by a hair's breadth did the worlds escape destruction. In that instant of

release they were shaken and riven to their very cores. The destruction, as they rocked and staggered back to their orbits, was unequalled in history.

Even on the smaller Mars, whose internal fires had been believed quenched for millions of years, volcanoes opened up, seas of molten lava spouted from thousand-mile fissures. But on earth, whose inner fires were still held beneath a comparatively thin crust, the destruction was far worse. The main line of weakness—the old 'earthquake line'—opened up along its entire length. A huge section of the earth broke loose, lifted—fell back, broken and distorted. By just so little had our beautiful world escaped complete disruption.

For some three days the earth continued to rush sunward into its orbit. Then it steadied, took up again a regular pathway—its definite orbit.

The volcanic action decreased, the earthquakes ceased, and a dazed and bewildered humanity began to gather up the broken threads of existence.

THE world was saved, but at what a cost! Nearly a tenth of its population was destroyed, its wonderful cities shaken to pieces or washed away by the tidal waves, its fertile fields over thousands of square miles utterly ruined.

Yet the destruction had not been beyond remedy. The general structure of the land areas remained unaltered, more than half the fields and forests remained undestroyed, and even a large part of the growing crops escaped.

But humanity had not only to repair the terrible damage, it soon found that it had to adapt itself to changed conditions of life. The terrific strain had altered the orbital speed of the world slightly and so now earth's distance from the sun was increased by some five million miles—not a great distance

as cosmic distances go, but still enough to make a great difference in earth's climate.

Then too, the increased volcanic activity meant more dust in the upper atmosphere, which in turn meant a cutting off of the sun's rays and also an increase in cloud formation and rainfall.

Together these changes meant a cooler earth, and at first it was feared that a new glacial period would result. This, however, did not come to pass, for the loss of solar heat was compensated for in a most strange manner.

In its collision with the Martian moon, our moon had been raised from a frozen ball to a globe of incandescence. The heat produced did not, however, penetrate immediately to the core of the satellite. As it did so, of course, the surface temperature rapidly dropped, and after a few days the whole mass became stabilized with a uniform temperature of about 700° Fahrenheit.

The collision had accelerated the moon's orbital speed so much that it approached its parent earth until it was within about a hundred-and-fifty-thousand miles of it.

Gone forever was the pale, cold moon of old; gone forever the mystic moonlight. No longer could lovers gaze on the cold witchery of ancient Diana.

Instead we gained a new beauty. No longer did the moon show us phases of brightness and dark, but always now it shone with a warm deep-red glow, a glow, that had a beauty all its own.

A huge moon it seemed to us who remember the old days, huge because of its nearness rather than because of its slight increase in mass. The heat given us by it more than compensated for the reduction of solar heat, and this, with the slight increase in atmospheric carbon-dioxide resulting from the volcanic disturbances, made the world even

more fertile and productive than before.

The day too was changed. The earth's rotation had been speeded up so that now it rotated in about twenty hours instead of twenty-four. This together with the slightly lengthened orbit gave us a year of over four hundred days. These two changes, strangely enough, were more difficult than all the rest to get used to. Our sense of time seemed to be upset by them.

For the first few days the task of reconstruction looked quite hopeless. Fortunately the food supplies were not destroyed and by careful distribution sufficient was supplied to all.

A week or so after the calamity, a fleet arrived from Venus bringing supplies and machinery of all kinds, and the promise that the Venerians would give all the help needed until the nations were again established on a stable basis.

This generosity on the part of our former antagonists proved one of the greatest factors in enabling the world to regain its former prosperity and happiness. Without such help the task would surely have been a long and bitter one.

Our fellow-sufferer, Mars, was helped in the same way by contingents from the other bodies, and it was not long before a reorganized Solar System appeared.

Thus did good come out of the terror. Humanity again marched forward, but now with an humbled pride, knowing that there are forces with which man may not meddle, with a new unity and solidity of purpose not only among nations but also between worlds.

Terrible was the lesson, bitter the fruits of it, but now for the first time could the human races present a united and co-operative front. Now had dawned an era of progress unexampled in history.

IT was nearly two months after the crash that a space-patrol, cruising outside the orbit of Mars, noticed a rocket cruiser coming in, apparently in great distress. She immediately went to the stranger's assistance, although no distress signals had been received.

What was the amazement of the patrol's crew to discover in the ship the old *Marterra* battered, disabled, wrecked, yet still living, still struggling to reach some haven of rest.

It seemed that the ship had been caught up in the swirl of the opposing vortices, caught up and flung bodily out into space like a stone from a whirling sling.

The shock robbed every one of consciousness, in many cases forever, but after a long time the survivors began to recover. The first to regain their senses revived those of their companions who were still living, and then they took stock of the situation.

They had been "out" for some five days according to such of their chronographs as still functioned. They had been flung outward away from the sun and were hurtling through space at a fearful speed, already well beyond the orbit of the asteroids.

Their motors were wrecked. Not that this mattered much for they would not have dared use them after their previous experience. Their radio equipment was smashed to atoms, so they could not signal for help. Fortunately the hull of the ship, though warped and twisted, had not been torn apart, and so their air supply had not escaped.

Only half the crew survived and many of these were injured so that they could take no active part in the work. President Torrens, though living, was too sick even to rise. Mackinnon was badly smashed, but able to sit up in a bed in his beloved engine



room, where his supervision was invaluable.

So the problem of getting the wreck into port devolved upon Captain Fredrickson and Joe Carson, both of them severely injured, and nobly did they battle against the fearful odds.

Since the ship had been completely fitted with the new sub-electronic motors, it had not been thought necessary to provide her with any of the older types of engines as auxiliaries, so now here she was, stranded in space with nothing but her atmosphere motors to drive her.

The story of how they finally succeeded in converting their focussing tubes into a crude sort of rocket motor is an epic in itself. It seems almost incredible that a handful of men, beaten and battered mentally and physically as they were, could have taken such a mass of wreckage and made anything at all out of it.

Yet they did succeed in making workable motors. Feeble, inefficient ones they were, truly, burning up the fittings and furniture of the ship for fuel. Against any great resistance they would have been utterly useless, but out here in free space they were able, after much wasted and ineffective effort, to turn their wreck of a ship around and bring it at last into a course that would approach Mars within a short distance.

How they expected to check the ship and prevent it from crashing to destruction as it reached the planet, they

themselves hadn't even tried to figure out. As Carson said,

"What was the use, anyway? We'd burned up all the furniture and most of the fittings. We'd nothing left except the clothes we stood up in, and it'd have taken more than a few clothes to stop the old crate with those freak motors.

"Anyway," he added whimsically, "we'd figured that something would turn up, since we are apparently unkillable, and—well, here you are, aren't you?"

TWO days later the battered wanderer was towed into port at the Martian capital. As she landed, Captain Fredrickson, now almost well again, stepped out and, accompanied by Mackinnon on his improvised crutches and Joe Carson, limped straight across to the M. V. T. C. offices. They entered and went directly to the dispatcher's room, where Fredrickson reported,

"Mail ship *Marterra* from earth reports arrival at Mars with four-hundred twenty-six bags of mail, all intact, thirty-seven days four hours late. Delay and loss by death of forty-eight passengers and twenty-nine crew due to cosmic disturbances."

And, as the dispatcher handed him his "Voyage Completion Slip," he turned and, with his companions, walked quietly into the captain's room.

As Joe Carson remarked, "That's that!"

THE END

# Relativity to the Rescue

*This story starts on Venus with its humid atmosphere. The general idea is that Venus is saved from the excessive heat of the sun by a dense cloud of vapor which blankets it and has virtually obscured its vision from astronomers so that comparatively little is known definitely about its axial motion.*

By J. HARVEY HAGGARD

**I**N the close tepid atmosphere of the cylindrical room there was hardly a sound. The broad windows, which followed the circular curve of the wall, were aberrated with tiny beads and rivulets of moisture deposited by the heavy humidity of the Venerian air. A gasoline lantern, swinging from the ceiling, lighted the interior with a caustic glow, while a swarm of insects flitted about the lantern, the illumination reflected iridescently from their gossamer wings.

At the table in the center of the room, directly below the lantern, sprawled a great drunken brute, clutching a bottle with one hand and with the other clumsily brushing the sweat from his shining, porous jowl. He was clad in dirty dungarees, with a ragged, sleeveless shirt, open at the chest, revealing his huge barrel of a body and the long simian arms. His mouth drooped bestial and full-lipped, his nose was shiny and bulbous. Beneath glaring eyebrows his black beady eyes were riveted with studied disapproval upon the back of a man who sat at a narrow alcove in the wall, before an array of radio and television instruments.

Though the hulking drunken brute uttered rumbling curses from time to time as he brushed aside the insects which buzzed about his face, his eyes did not leave the other man, nor did the furtive look in their depths disappear.

Finally the man in the alcove turned with an expression of deep worry lining his face. His features were clean-cut and mature, but the heavy pall of responsibility seemed to give a slight stoop to his virile figure. He too was clothed in dungarees, and his sleeves were rolled up to the elbows, but his clothing presented a cleaner appearance than that of the man at the table.

"It's no use," he cried bitterly, with a gesture of despair. "Not a sound, not a darned stutter from the radio. Those heavy moisture blankets, which pile around Venus up to her stratosphere, just refuse to allow the waves to penetrate. I can't connect up. And that relief-ship should have been here three days ago!"

The great brute at the table leered contemptuously at this display of emotion.

"Hell!" he rumbled. "Cold feet! Eh, Brice?"

Brice Burney settled his troubled grey eyes upon the man sprawled at the table, and for a moment a glint of suspicion glimmered within them.

"Cold feet!" he exclaimed angrily. "Cold feet, Bellen? Call it anything you like! But I don't like it! Millions of dollars' worth of Venerian jewels over there in the safe, and the relief ship three days overdue! Meanwhile Vallard is out in the jungle, God knows where, and the natives roundabout are



*Black Silvard was stooping over the controls, turning his head sidewise and peering like an owl at the large televisior screen.*

getting tough and troublesome! No, I don't like it. And I can't see how you accept it so complacently!"

This last was uttered with a challenging outthrust of Brice Burney's jaw. For a moment the men glared at each other. Then Bellen relaxed.

"Have a drink, guy!" he growled. "You're going nutty!"

**B**RICE BURNEY refused the drink and nervously began pacing up and down the limited confines of the room. It wasn't so much the fact that the relief ship was overdue that worried him. It was those jewels, worth millions of dollars on earth, for which he and his comrades had risked their lives, trading glittering gaudy ornaments to the natives for them. It was dreadfully risky business. The natives, wild as Apaches, lived in the jungle about the trading post. Where they found the priceless gems, Burney did not know, but he did know that the savages were only too willing to trade them for glittering glass baubles from the earth. It was this fact which had made the trading post on Venus profitable. Only men such as he and Vallard and Bellen, who did not fear death, would risk their lives in such an occupation. But it was adventure, and adventure had always led Brice Burney's lonely life.

But now he was thinking of those jewels. Worth millions! And Black Silvard, the Space Pirate, might lurk anywhere in the space outside. Brice Burney knew Black Silvard, had worked with him in the laboratories of the Venus Trade and Commerce, Inc., upon earth. Black Silvard had been a genius, though warped inwardly with selfish greed. He had discovered a new principle in space flight which took space ships to other dimensions. Fitting a space ship to demonstrate this discovery, of course at the expense of the Venus

Trade and Commerce Co., he had disappeared into space and never returned. Now, he was a mythical Captain of a ghost ship, a ship which appeared out of nothing in the depths of space and attacked merchant vessels laden with rich cargo, or ransacked the trading posts at which great wealth in jewels had been accumulated. The mysterious clandestine power of Black Silvard now reached into the very heart of commerce and trade; by some inexplicable power he seemed able always to know when a rich cargo was ready, either at the trading posts or the embarkation points of various planets. Despite precautions, Black Silvard always appeared out of space flaunting the skull and bones upon the pugnacious prow of his space ship, death-rays kniving from her ports, and the merchant vessels would he left a crumpled wreckage of space. A bountiful reward had been offered for his capture, and the Venus Trade and Commerce Company was making every effort to effect his demise.

Darn it all, it was enough to give a fellow the creeps! Brice knew that this very trading post had been raided twice before by Black Silvard, just when rich accumulations of jewels had been prepared for shipment. And that relief ship—three days overdue.

Suddenly he turned on his heel and strode over to the broad curving window. Wiping aside the moisture he peered through its distorted transparency. Dimly he could perceive the small clearing which surrounded the trading post, could discern the twisted grotesque forms of the gigantic trees which formed a dense Venerian jungle about it. Giant fern fronds, broad lambent leaves, jagged spumes shooting upward; all were dimly obvious, even in the eternal Venerian gloom suffused from the dense cloud mantle overhead.

And in that jungle lurked danger!

Savage beasts, savage peoples! The primal jungle-men of Venus, irascible and undependable, yet who were the source of all of the fine Venerian jewels so highly prized upon earth.

VALLARD had been gone a week. Brice liked Vallard. He was young and clean, an ambitious youngster from the earth who hadn't yet been in the jungles more than a year. A young man who wanted to go through college, and who would risk his life in the jungle, until he could accumulate the means to do so.

There had been rumors of a new Venerian jewel, which the traders suspected as being a diamond. Vallard had gone out, had probably penetrated farther into the depths of the jungle than earth-men had ever been before. Meanwhile the natives had got surly. Brice and Bellen had considered it wise to hole up in the trading post and await Vallard's return. If it wasn't for the fortune of jewels awaiting the relief ship, Brice would have gone out to look for Vallard.

Brice at last turned from his futile observation. The moisture had soon formed again upon the window and the glass became opaque. He mopped his perspiring brow with a sodden handkerchief.

"I'd like to be out there with Vallard," he said. "Anything might happen."

"Aw, Vallard's all right," growled Bellen. "He has his 'project gat', and he could sweep out a jungle of them pавvies if need be." He swallowed a tumbler of liquor noisily. His great brutal face was set drunkenly, and the eye lids were drooping for want of sleep. Brice had returned to the radio instruments and was attempting to make connections. A small, electric clock chimed the hour of eleven.

As the sound of the chime penetrated his consciousness Bellen rose slowly, sobriety momentarily in his eyes. His apprehensive eyes stole again to the back of the man who worked unceasingly over the transmitter. He yawned obstreperously.

"Guess I'll take a little nap o' sleep!" he said thickly, and lurched awkwardly toward a door which led from the room. The door had been widely ajar to permit as much ventilation as possible. It swung to behind Bellen. As the latch clicked audibly Brice was startled. Swinging in his seat he stared for a long moment at the closed door.

## CHAPTER II

### The Attack

WITH an exclamation Brice sprang to his feet. From the jungle outside had come the muffled ricochetting of bullets from a projectite gun, and dimly he could hear a chorus of wild native whoops and war-cries. He strode to the door and swung it open, then listened intently.

Water was dripping incessantly from the eaves and it splattered on the stone steps at his feet. The clearing, muddy and filled with tiny rivulets of water, stretched into a mist which disappeared into the heavy darkness of the jungle's edge. Above the spattering of water he again heard the cries, sibilant and cacophonous, re-echoing from the jungle and nearing rapidly. Then again the sharp hiss and whine of projectite bullets. A faint call sounded from the jungle as the cries approached. Straining to the wind, Brice recognized it as the voice of Vallard.

"Brice!" came the faint call down the wind. "Brice! Oh! For God's sake!—help!—help!"

Brice waited to hear no more. He sprang back into the room. Seizing a



small hand projectite gun he leaped back through the doorway and out into the damp mist.

"Vallard!" he shouted. "Vallard, old man! Hold out. I'm coming!"

Cold watery fingers clutched at his bare face and forearms as he ran across the clearing toward the source of the sound. Then the wild, war-like cries suddenly burst loudly upon his ears. From the gloom of the jungle's edge a figure was staggering with an obvious attempt at haste. The bedraggled figure was clad in a dark slicker, murky with crimson streaked mud. As pursuing shadows separated themselves from the jungle following after the fugitive, Brice came up to him and caught his staggering body.

Vallard's face was haggard and his eyes were bloodshot from exhaustion. A bloody gash over his eye flooded crimson over his cheek.

"**A**MMUNITION!" he gasped as he leaned weakly upon Brice for support. He gestured toward the gun hanging limply in his hand. "Gone. Battery dead . . . burned out . . . just now! The pavyies—damn 'em—closin' in."

"Okay!" cried Brice, reassuringly. "Lean on me. Then we'll run for the post—like the devil!"

Uttering wild screams of rage, the jungle-men of Venus hurled themselves from the jungle toward the men. In ferocity they were like nothing but devils incarnate. In the gloom Brice caught a glimpse of their globular pod-like bodies, supported by four slim simian-like legs each, projecting themselves forward like leaping spiders. The fat, sebaceous heads, surmounting their globular bodies, were illuminated with single large orbs, which glowed with shifting opalescence. A cavernous mouth yawned beneath the eye of each jungle-man, but

it was not from this aperture that the sound of their cries issued. No vocal chords were within the Venerians' mouths, as Brice well knew. Instead, wiry antennae-like spikes projected from their foreheads. Vibrating shrilly, these wire-like projections changed volume and frequency with as much ease as vocal chords.

Sweeping the front ranks of the oncoming horde with the projectite revolver, Brice saw the nearer ones pitch forward, riddled by the continuous stream of bullets which sputtered from his gun. Then, grasping Vallard firmly, he half-carried the exhausted man through the mud in a mad dash for the open door.

With the jungle-men closing in upon them, Brice realized that with their desperately slow pace they could never make the open cabin door. Jagged quartz weapons hissed by them, thrown prematurely from behind. Brice caught a glimpse of Bellen in the open doorway, a startled look on his face. The huge brute seldom was totally drunk and he appeared in full possession of his faculties as he stared out at the scene which must have been surprising to him. In his hand he clutched a projectite hand-machine gun. Brice had made a desperate plan in an instant's notice.

"Go on!" he shouted into Vallard's ear. "I'll stand them off here till you get into the doorway. Then I'll make a break for it under the cover of Bellen's gun."

Vallard understood and nodded. As Brice released him he lurched forward and stumbled for the doorway. Brice wheeled.

The junglemen were almost upon him. He could see their malevolently opalescent eyes, shining against the darkness of the gloom and jungle behind. Their bodies, sweating and podlike, were dim



and almost indistinguishable as they sprang upon the terrestrial.

The nearest drew back a large segmented tentacle which served in lieu of arms. He launched a disk-like weapon of gleaming quartz which sailed straight for Brice's head. Instinctively he ducked, but the missile grazed his head and dazed him.

The world reeled, while in its center the creature leaped like a plummet. Almost unconsciously Brice realized that the projectile revolver in his hand was spitting forth intermittent death. But his strength seemed to have gone from his wrist. Weakly he raised it, seemed unable to aim it at the maddened thing which was leaping for his throat. Then, in the last moment, the gun centered upon the fat podlike body. A tracework of holes tore across its center. With a wild scream which tore almost within his ears the jungle-man slumped to the ground at his very feet.

Meanwhile, the world was righting for Brice. He saw the ring of demoniac beings closing, heard their screams of death! Death! Well, damn them, let them have it! Death! A stream of missiles whined from his gun into the ranks of the inwardly pressing Pavvies, or jungle-men.

Scintillating quartz weapons whistled by his head, but as the Pavvies crumpled and swayed, their aim was too poor or too diverted to be accurate. Just as fast as they crumpled, others pressed onward. He could see them, dropping like huge spiders from the trees of the jungle, surging in a stream toward him. What was the matter with Bellen? He couldn't hold them back forever. Eventually they would overwhelm him.

**W**HEELING swiftly, Brice fled back across the clearing. He had to chance it now or never. With the pack at his back he stumbled up the

steps, just as Bellen, in the doorway, opened up with the machine gun. With the deadly spray from the machine gun sending triple streams of bullets into their ranks, the Pavvies hesitated, then turned to flee.

Vallard had stumbled to the floor and lay breathing heavily. Brice wheeled and slammed the door.

"Quick!" he cried to Bellen. "Man the windows!" He stepped to the great curving window, pressed a button on the lower sill. Small panels slid aside, revealing rectangular apertures below the sills. Dragging forth machine guns, he stationed them before the firing apertures.

Outside, the screaming savages had reconnoitered. Now, in a surging pack they came forward.

"The lights!" cried Brice. He turned and made swift manipulations on a wall panel. The light from above vanished, leaving them in darkness. Another deft movement and broad floodlights outside and above the windows were spreading suffusion of light, halfway out across the clearing, lighting up the blood-thirsty pack mistily through the moisture aberrated glass. These floodlights were a special preparation made for such a siege. The panorama outside now was a weird tableau as seen through the windows, and in its utter madness it resembled a moving picture screen depicting a pack of monsters such as might have been dreamed of by Jules Verne.

A leaping horde! Writhing tentacles! Sharp weapons borne aloft, gleaming, malevolent orbs; all were apparent in a jumbled leaping maze as the mob surged onward.

In a moment the clearing was a shambles under the floodlight. Crouched at the deadly machine guns which sent multiple lines of intermittent bullet tracery whistling from their muzzles, the two men wrought wholesale slaughter.

In a few moments the clearing was abandoned by all living Venerians—and there was a gory death-scene where the creatures lay jumbled in torn heaps. Faint cries still came from the jungle, but the earthmen felt free from attack for the time.

Brice restored the illumination to the interior. He was breathing heavily. Frowning, he confronted Bellen.

"You were a long time in covering my retreat!" he accused. Bellen mopped his brow.

"Jammed!" he said. "I couldn't hardly get it to workin'."

Brice turned to the exhausted Vallard who yet lay on the floor. A draught of whiskey soon brought him around. He was helped weakly to a chair.

"DIAMONDS!" he rasped hoarsely. "Diamonds!" Clutching at his breast he withdrew a slick, oily pouch. Opening the bag he spread forth a pile of rudely cut jewels, each the size of a marble.

A million dollars lay represented upon the table before them. Jewels! Venerian diamonds!—for which they had risked their lives. Brice suddenly hated them—hated their sparkle. There was a splotch of crimson upon one of the largest. Blood—blood of man.

With greedy glittering eyes Bellen scooped them into his palm. Riches and pleasure rose to his vision as he mashed them together in his fist. He scowled as a moment later he placed the jewels in the safe with others of its kind.

Vallard had been wounded on the thigh. Brice dressed the wound and helped the exhausted youth to his bed. In short delirious sentences he told Brice how he had penetrated far into the jungle, to a wild tribe of the Venerians. After trading for the diamonds

the traitorous creatures had set upon him and he had been forced to fight his way slowly back.

It was with a grim face that Brice returned to the main circular room. Staring out the window toward the dark jungle's gloom he could yet hear the cries of the aroused Jungle-men. He sighed as the burden of their position again became manifest.

"Those devils are likely to stay roused for days, Bellen," he said. "We'll have to draw lots for first watch!"

When Bellen drew the first watch Brice spent a large part of the time at the radio, which time he should have used in sleeping, futilely striving to get a message through the heavy atmospheric blanket which surrounded Venus.

### CHAPTER III

#### The Ship from Space

FRANK VALLARD'S fingers were trembling as he crouched down by the machine gun. He opened a panel in the stock of the gun and inserted a small battery into a close-fitting compartment. It was the last battery. It meant that there were two hours fighting left in the machine gun. Another attack by the Jungle-men would leave them practically defenseless. And the relief ship had not yet come.

Two days had passed since Frank Vallard had stumbled into the trading post. Although his minor wound was not yet healed, it did not prevent him from assuming his duties. However, the strain was telling on him. His actions were nervous and indecisive. The glances he cast through the aperture at the jungle outside were full of dread and terror. He fondled the machine gun nervously.

These projectite guns were really sprays of electronic charges. Their secret lay in the fact that their batteries were not of the common type. By-

man, the inventor, had discovered that the spark from his battery, glancing over a peculiar polished metal, caused this metal to emit electronic discharges of terrific force.

"Two fighting hours," Vallard murmured wildly, caressing the blue metal which sheathed the intricate mechanism of the projectite gun. Brice had just come into the room and he stood silently watching the boy, who was now madly searching his pockets for a cigarette.

"Damn the luck, Brice!" he cried. "Aren't there any cigarettes?"

Brice shook his head. Vallard angrily snapped the match into little bits with which he had prepared to light the cigarette.

"No cigarettes!" he cried, his eye wild. "No ammunition! Provisions running low. In the name of Heaven, everything will be gone if that ship doesn't come in soon."

Brice walked over to the youth and placed a paternal hand on his shoulder.

"Take it easy, Frank!" he cautioned. But his words, instead of soothing, seemed to infuriate Vallard.

"Take it easy!" snarled the boy contemptuously. "Take it easy! God, man, how can anyone take it easy?" He wrenched away from Brice and began to pace the room with increasing panic. "Death! Those damnable Venerians. I tell you we might as well walk out and meet them in battle. It's quicker, and better than this torment!"

"DON'T give up hope. The relief ship will come yet!"

Vallard was pacing the room madly now.

"The relief ship will never come!" he cried. "And you know why. Where's Bellen?"

The eyes of the two men met with understanding. Each realized the sus-

picious of Bellen were mutual. Just then the door to the adjoining bedrooms opened and Bellen came into the room. His great brows were drawn down in a glare.

"Anyone say my name?" he growled.

"Yes," interceded Brice, quickly. "Vallard's trick is up, and it's your turn." He wondered if Bellen had been eavesdropping.

"Two hours in the machine gun!" murmured Vallard, again pacing the room. "Two more hours!"

"Better turn in, Vallard," warned Brice. "You'll need your rest!"

"Rest! I couldn't rest knowing there was but—two more hours!"

Bellen took a huge bottle from the table and uncorked it. He tipped it up and gurgled some of the liquid noisily.

"Have a drink," he growled, wiping his lips with his hairy hands. "You're turning rat! It ought pep you up!"

His accusation infuriated Vallard. He turned and confronted Bellen.

"How can I rest, how can I sleep!" he shouted. "All the time I know that just out of space there hovers the Space Pirate! He got the relief ship, and he's just waiting to settle down and take the post! Oh, I know! He did it once before and he'll do it again! Black Silvard always knows when a post is rich for hauling. This post has been raided three times. I was here the last time! And every time—you have been here—Bellen!"

His manner was directly accusing. Bellen, spraddled defiantly, purple with rage.

"What do you mean?" he said thickly.

"I mean just this!" shot Vallard wildly. "There's been a leak, somewhere—right within this trading post. There is only one person who could have leak-

ed to Black Silvard, and that is you—Bellen!"

Bellen's huge figure seemed to be frozen in surprised rage. In one hand, far back, he held the bottle. Suddenly, with a curse, he moved. His bare arms shot out like lightning. The heavy bottle cut a swift arc through the air. With a sickening crunch it hit Vallard's head, then dropped to the floor with a clatter. For a moment the boy's eyes glazed, and he seemed paralyzed with surprise. Then his knees gave way and he slumped to the floor.

Brice had changed. His face was hard and white, his muscles tense. Directly behind him was a machine gun, nestling before an aperture.

"Bellen," he said clearly. "I'm going to kill you. You fool, don't you think I've been watching you? Don't you think I knew you'd been tampering with the radio, so I couldn't get communication through? Bellen, do you know who I am? I am a secret representative of the officers of the Venus Traders and Commerce. I came here to get you, and I have got you.

"**B**ELLEN, you are a half-brother to Black Silvard. We knew information was leaking through you to the pirate. I knew Black Silvard, before he turned pirate. And I knew that he would use such as you. Bellen, you've given yourself away. You are a spy of Black Silvard!"

Baffled rage spread over Bellen's features. He tensed his body to spring. Then his eyes roved to the machine gun just behind Brice. With a snarl of rage masking his face he sprang.

Brice turned quickly, swept the gun around. But Bellen was upon him. Silently they wrestled for possession of the gun. Huge brute muscle against lean sinew. Straining, they wavered back and forth.

Bellen's coarse, brutal face was close to Brice's, his caustic breath panting hot from his nostrils. It was a battle which each realized would be to the death. Then both paused simultaneously.

A wild pandemonium of screams had burst just outside the doorway. There was a resounding crash, and the door teetered on its hinges. With a splintering smash a quartz club shot through the large curved window, shattering it and falling to the floor at the feet of the struggling men. The Venerians had renewed the attack.

Again came the resounding crash, and the door fell inward, its hinges wrenched from the panels, while the Junglemen burst in and sprang toward the terrestrials.

Their enmity momentarily abandoned in the crisis of danger, Brice turned the machine gun about. Death! It faced them all now. They had been caught in a moment of forgotten caution.

There was no retreating now. Even as the gun began to chatter beneath Brice's hands he realized that they would eventually be overwhelmed. As the projectile gun mowed down the front ranks, the ones behind surged over. Glittering weapons whirled, shot toward the terrestrials.

Then the air was suddenly rent with a resounding roar which vibrated every molecule. The roar quickly went up the scale and became a high-pitched tremulous whine.

The Venerians halted in their tracks, frozen into inactivity. For a moment they listened, then turned and ran. They had come to know and fear that deadly sound, for it always preceded the coming of a space rocket. It meant the reinforcement of the enemy. Their superstition had attributed a great power to the craft which appeared out of their cloud-blanketed heavens.

"A space sphere!" cried Brice. He strode to the window. Through its jagged aperture he could see the clearing, lighted yet by the floodlights from above. Into the muddy expanse a space craft was settling. But not a sphere. Not the globular space ship of the Venus Trade and Commerce Co. No, it was a great ship off the outlines of an ovoid. It was the pirate ship of Black Silvard.

Brice heard a sound behind him. Wheeling quickly, he was just in time to see a heavy improvised club, wielded in the hands of Bellen, descending on his skull.

He suddenly fell into a pall of deepening darkness and oblivion.

## CHAPTER IV

### Black Silvard

**B**RICE awoke to a curious, ascending sensation which he at first took for part of the nausea of returning consciousness. A moment later he identified it as the accelerating motion of a rising space ship.

His head throbbed intermittently. As he opened his eyes and sought to move he found that he was lying bound on the floor of a tiny cell-like room. A small Napoleonesque man stood over him, resplendently garbed in contrasting colors, fingering a sleek mustache as black and shiny as a raven's wing.

For a moment Brice stared up without comprehension. Then a passing reflection through the space-port in one wall of the cell fell clearly upon the little man's picturesque features. The features were swarthy and hawkish, surmounted by dead-black hair. The eyes were orbs of cold, emotionless fire.

"Ah," he said in a bantering tone. "You recognize me?"

Brice nodded.

"Black Silvard!" he ejaculated.

The pirate chuckled with amusement. Very well could each of them remember the time, when this resplendent figure was naught but an unprepossessing chemist, working side by side with Brice Burney in the laboratories of the Venus Traders and Commerce. Once the two men had been friends of a sort. Brice realized that his life had only been spared to tickle the sardonic humor of the pirate.

"It takes a thief to catch a thief," mused Black Silvard. "Also, I presume, in the logic of the terrestrial authorities, it takes a chemist to catch a chemist. Really, it amuses me. Did you really think you could apprehend me, Brice?"

Brice strained under the contempt in the other's words. Hot wrath surged within him, but he forbore to speak. He knew that in his present position diplomacy would serve him best. He forced a grin.

"I guess you win the first deal, Silvard," he admitted.

"And the last," smirked the pirate significantly. "As far as you are concerned."

"Nevertheless," continued Brice. "There are other men, and other hands to be dealt. Your day will come, Black Silvard. It is inevitable. No transgressor of justice in the history of time has escaped eventual retribution."

**S**ILVARD scowled. "Perhaps I am the supreme transgressor," he suggested. "No space ship of man can ever overtake this ship. And you know why, Brice. It was my invention which made it so. My men are outlawed, they fight like demons! If a battle gets a little hot—presto! I turn a lever. Immediately our ship swings away. Faster and faster! And finally vanishes into

obscurity, as a ghost melts into the shadows!"

"You discovered this power, though, Silvard. You are but a man. Other men will find it also. And then they will hunt you like a dog into your dimension of invisibility!"

Silvard threw back his head and laughed heartily. Brice's conviction seemed to amuse him. Wiping tears of mirth from his cheek he looked down at his defiant captive.

"My good friend," he chuckled. "What would you suggest doing? I am a great pirate, admitted! But so much greater will be the fall! See—Brice, I am fearful. What shall I do to evade Fate?"

"You might surrender yourself to me and accompany me to earth as my prisoner."

The audacity of the suggestion tickled the humor of both men in the light of the situation. Once they had been friends. Now, even though one was captive of the other, they still had something in common.

"My friend, my enemy," cried Silvard, when his mirth had subsided. "You amuse me, and touch a ticklish spot in my vanity. See, I am going to be good to you. Once we were friends. I shall cut your bonds. I shall show you the world which I rule, which I have made, I shall show you a palace on a beautiful planet. Riches—and pleasure. That—before you die. A moment of happiness—before death! It is enticing, is it not? At the present time you will be kept a prisoner in this cell. Later you will be given leave to wander through certain portions of the space-ship. There will be no danger—you cannot escape or do harm. My watchdogs will guard you well. Anyway, there will be the week or two to worry about."

"And where will we be then?"

Silvard laughed again, though less pleasantly.

"I will be occupying a luxurious palace on a remote planet, surrounded by lavish beauty and epicurean comfort. Where you shall be, none shall know, much less guess—" He shrugged, and elevated his dark brows. "Does anyone know where you will be—after your spirit has passed, Brice?"

Laughing heartily at his pleasantry, Silvard withdrew a gleaming knife from the sash at his waist, and stooping, cut Brice's bonds. Then, his laughter, re-echoing, he turned and touched the wall with a large opalescent stone set in a huge thumb-ring. A door slid aside and closed again as he stepped through. Brice was a prisoner on the pirate ship of Black Silvard.

In the half day which followed Brice was fed by a smirking pirate who entered with a great platter filled with steaming food. He waited as Brice ate, and left again, with Brice still a prisoner.

Brice occupied much of his time staring moodily through the circular transparency of the space-port. The star field, backgrounded by the blackness of space, seemed immovable. Of the jewel-bedecked firmament, only the sun stood forth with blazing eminence. His thoughts were despairing—of the mission on which he had been sent, and its unfortunate end. How he had bungled! He had been sent to detect a possible leakage of information to Black Silvard, and had been trapped himself. Brice couldn't bear to think of Vallard.

Black Silvard himself ushered Brice forth from his cell for a pompous display of the space-ship. The space vessel was shaped roughly like a great flat ovoid, with a dome-like projecting conning-tower commanding its upper surface. Space ports were plentiful in the sides of the huge armored monster,



and rows of them ran completely about its surface. The vessel was divided into two floors; the lower one occupied by the machinery and the men's quarters, the upper one being a sumptuously furnished apartment for Black Silvard. Dark-hued girls, of small but perfect proportions, languored on the cushioned divans and recesses of the apartment. Servants were plentiful, and came at Black Silvard's slightest call. Silvard explained that both the girls and the men were natives of Mars' largest satellite.

As they were passing through a large room which might have held an entire night-club party, and which was finisher in modernistic design, a very loud burst of laughter suddenly came to their ears. Silvard started, and a flush of anger came to his cheek, as he distinguished a rough masculine note in the laughter.

Here, in this upper apartment, was his sanctuary. It was forbidden for his men to enter here. Seizing the projectile gun at his waist, Silvard angrily stalked for the source of laughter.

It came from a curtained alcove, furnished with lavish cushions and overhung with artificial palm trees. Soft light filtered through the boughs, and it presented a scene of great beauty. Beyond, hanging like a great silver moon in a dark sky, was a space-port, from which a suffusion of light was spreading into the great alcove.

In the center of the alcove, sprawled back drunkenly on a great cushion, sat Bellen. His arms were about two laughing Martian girls, while others of them crowded around and joined in the joyous hilarity. Upon the floor lay empty bottles, and a tiny pink tumbler, which had been broken.

For a moment Silvard stood between the parted curtains, wrath mantling his flushed features as he watched the great

brute, Bellen, pursue his drunken revelry.

Without a word, but with a face black as a thunderhead, Silvard strode into the alcove and halted before Bellen. Brice followed, watching the tableau with wondering eyes.

As the Martian girls observed Silvard they uttered little squeals of terror and ran from the room, disappearing through curtained passageways. Bellen sat staring drunkenly upward, his hairy arm yet about one of the slender Martian girls, who was now attempting to escape.

"BELLEN!"

The single word was strident and commanding. It penetrated Bellen's consciousness and left him staring upward. His great brows glared in anger at the sudden cessation to his enjoyment. Something of the portent of what he had done became impressed upon him and he slowly gained his feet. The Martian girl cringed back into the cushions and hid her face.

"Bellen!" cried Silvard savagely. "If it weren't you, I'd kill you, you loathsome dog! But you don't know better! Back to your kennel, dog!"

Bellen at the command stared without understanding. His thick brutal lips opened and closed helplessly as he gazed from Silvard to the man, who he thought was kept bound as a prisoner.

"You hear me!" shouted Black Silvard, menacing with his gun. "Back to your kennel!"

"Say—" blundered Bellen. "Why—ain't I allowed up here?"

"No!" thundered Silvard, so angrily that Bellen cringed. "None is allowed here, except at my order."

"Then what is that bird doing here?" cried Bellen in an outraged tone, pointing to Brice.

"At present," said Silvard suavely, "he

happens to be both my prisoner and my guest. Inasmuch as you are not up to the intellectual standard of being my guest, your company is forbidden in the upper apartment.

"Now go!"

Bellen eyed Brice with malevolent rage, as if it were he who was responsible for his present position. His lips were writhing and his fists clenched as he turned, about to go. He hesitated for a last thrust.

"He's a prisoner!" he burst to Silvard.

"And a damned spy! Let me kill 'im.

"Just let me at 'im."

When he was gone Silvard turned away the Martian girl, who was slinking away.

"Valda!" he ejaculated. "I would not have thought it!"

Throwing herself on her knees before him, she pleaded for her life.

"On the penalty of death!" threatened Silvard, "I forbid you ever to see Bellen again!"

The incident had ruffled Silvard's temper, but he soon regained it as he ushered Brice about the ship. Brice was surprised to find him affable, even though he knew Silvard was refined and educated. He could not know the loneliness which Black Silvard sometimes felt for earth and his former acquaintances. This, had he known it, was merely a freak mood for the temperamental pirate. When he tired of playing with Brice he would have him executed at a word. Brice, knowing somewhat of his nature, realized this. Surrounded by the luxury, he could not help but compare himself to a man who has sold himself to the devil for the price of a few days of pleasure.

He could not forget that death was always lurking pre-eminent on his dark horizon.

## CHAPTER V

### Pursuit

IT pleased Silvard to make a great display of his pirate ship. He treated Brice as if he were a magnificent guest, spoke in impressive bombastic phrases, and served him with rare liquors. Then, as a climax to the display, he escorted Brice up a rampway which led into the conning-tower and control room.

The dome which curved upward and formed the roof of the conning tower was transparent and afforded an unobstructed vista of the firmament above and about. It was almost as if Brice was standing on the back of a monster elephant, for the transparency of the conning tower made it seem at once invisible and unreal. He could see the huge riveted sides of the armored monster sloping to each side. Beyond that—the depths of space. For a moment he felt giddy.

Then he noted the control panels inset within the transparent walls, and the two pirates who guided them. Intricate arrangements of controls and studs, flashing iridescent bulbs coruscating. Long tubes of light dashing through endless mazes of vacuumized glass!

It was evident that the light which flickered spasmodically from the controls was injurious to the eyes, for both of the pirates who acted as pilots wore heavy glasses of high magnifying power. Their eyes were gargantuan behind the lenses, and the brows and lashes were hidden behind heavy rims. In the illumination of the variegated colors upon the control boards, their faces were ghastly as death.

Suddenly it became manifest that something unusual had aroused their attention. Running from one instrument to the other, the faces of the pilots

were soon filled with apprehension, and one of them wheeled to salute Black Silvard.

"Two terrestrial space patrol vessels in pursuit, sir!" he cried.

Black Silvard cursed in picturesque fashion.

"Get them on the visor?" he cried.

Under the control of the pilots a large screen became milkily opaque and gradually clarified to reveal a picture of a part of the firmament. As one of the pirates spun a small wheel along a moving way, the scene neared, and the spherical shapes of the police vessels seemed to inflate like balloons as their perspective distance decreased.

"At their present rate they will overtake us within thirty minutes," calculated one of the pilots.

"Damn!" cursed Silvard. "That kid at the trading post must have gotten word through."

"You mean Vallard?" asked Brice, hope in his voice.

"He looked dead or done for," continued Silvard. "We left him lying there. He must have repaired the radio and sent a signal through!"

"Or perhaps the relief ship came!" suggested Brice.

Silvard cast a peculiar glance at his prisoner and uttered a dry laugh.

"The relief ship will never come through. We scattered its disintegrated ashes in high space. Bellen kept us posted about its coming by radio. He had a set in his room."

Brice clenched his fists helplessly. Now he knew why Bellen had stayed so closely in his own room. If he ever got a chance to strike back at these pitiless murderers!—but he was unarmed! Black Silvard and the two pilots carried projectite guns and knives in their belts. Even providing he could overcome one of them and by a miraculous stroke of luck take his weapons he

would be a single man against the entire ship's crew. No, Brice wasn't foolhardy.

Mumbling under his breath with irritation, Silvard strode to a small pedestal which projected from the apparatus and lifted a hood which covered its top. A single large lever protruded therefrom.

"A twist of the lever," he mused. "Then our ship would commence slowly to fade, to disappear—No!" With a sudden exasperated jerk he replaced the hood. He appeared to come to a decision. "We shall fight. My men ache for a real good battle. We will not flee from these little police vessels."

ALL of a sudden he was the leader, the commander. As he stalked to a megaphone he resembled a Napoleon of space, more than ever.

Crisp, laconic orders shot into the transmitter to his officers in other parts of the ship. Brice felt the sudden deceleration of their speed. In the screen visor he saw the space police vessels draw rapidly nearer.

"Prepare rays of heat concentration!" Silvard was ordering. "Hold electrospheres in readiness to project, and prepare conductite bombs for emergency!"

The crisp answers coming from below showed how perfect an organization Black Silvard maintained upon his pirate ship. A ship fitly named—he called in the *Space Demon*!

As the orders given by Silvard were being carried out there was a moment's respite. Silvard turned to Brice with a smile of pride playing about his dark thin lips.

"You will see," he boasted, "how the men of Black Silvard fight!"

The pursuing space spheres became quickly visible to the eye. Brice knowing that these ships were the pride of the earth, thrilled as he peered through the

transparent dome and saw them soar swiftly down upon the pirate vessel.

"Have rays of heat concentration in readiness!" Black Silvard's voice was perfectly cool. His eyes did not leave the two approaching spheres for an instant. He stood nonchalantly at Brice's side, revealing, neither in his attitude nor in his expression, that aught but an idle conversation was in progress. A microphone held by a near-by attendant relayed his orders to his officers below.

"Fire!" he commanded.

Instantly from the blunt stern of the space monster two great rays bit out into space, then others, too numerous to count. These rays, scarcely visible because of the very small amount of stray particles in space, were tinged slightly with green. Crisscrossing swiftly they flashed back and forth.

An ordinary space ship would have melted under the impact of the ray, but the police space spheres, heavily armored were hardly harmed. The tracks of the ray-beams as they crossed its surface were merely marked by tiny molten rivulets of metal which cooled almost instantly, under the influence of refrigerating devices which Brice knew were present beneath the outer armor of the other vessels. Soon, however, the spheres resembled Mars with all its intersecting canals.

An attendant had entered and given Black Silvard a pair of powerful glasses. At a word from Silvard a similar pair was given to Brice. Through them he was able to see the next move, which was made by the police vessels.

Square panels slid aside in the spherical surface of the attacking vessels. Through the dark apertures long metal noses slid, then turned their projecting barrels unwaveringly upon the pirate ship. From their nozzles, balls of incandescent fire leaped—whirling swiftly

toward the *Space Demon*. Gaining in mass, the great balls of fire shot like incandescent clouds across the intervening space. Striding on the armored surface of the *Space Demon*, the spheres burst. Splattering like huge drops of water they licked in dazzling lambent tongues around the space vessel and lingered, led by some inner combustion. A continual stream of these fiery projectiles leaped out for the *Space Demon*. Soon most of its surface was covered by a pulsating sea of lingering flame, which lashed out and sought to surround the vessel.

In a moment Black Silvard's imperturbability was dropped.

"ASCEND!" he shouted to the pilot. "Ascend!"

Racing up the armored back of the space monster came a tide of fire. Lashing, raging! Brice knew that if once the *Space Demon* was surrounded by the flame she would be doomed. The intense heat would cause her outer armor to expand and crack, wrenching it from her inner supports.

A tide of flame! Racing! It lashed up, soared around the transparent dome, a caldron of raging, blinding flame. Groping at his momentarily blinded eyes, Brice thought the end had come. A moment—surrounded by fire—the *Space Demon* would crack! A surge of ascending power almost threw him off his feet. When next he opened his aching eyes the ship was free. Below them a sphere of raging gases blazed for a moment, then was extinguished. Waiting above—were the two police spheres, hovering together.

Brice became aware of Silvard, frantically shouting commands down the transmitter. "The electro-sphere! The electro-sphere!"

In a moment his command was obeyed. Great torpedo-like bulks of metal

slid out into space from the bow of the *Space Demon*. Like a flight of great pigeons the electro-spheres settled down upon the two space spheres.

No result was obvious at once. Then the two space spheres suddenly leaped from each other as if an invisible explosion had taken place. Black Silvard laughed triumphantly.

"Ha!" he cried. "Separated. Now I can finish them one by one. A little invention of my own, Brice. Electro-spheres, charged with positive electricity. They in turn charge the spheres on contact. The two spheres are similarly charged. Like charges repel each other, so at once the two leap apart!"

Meanwhile the *Space Demon* was swooping down upon one of the tiny spheres like a hawk on a bird. Again came Silvard's command. A swarm of concussion bombs focussed on the helpless sphere. As they exploded a green vaporous gas formed a mist about it and hid it from view. Without waiting to investigate, the *Space Demon* pursued the other and repeated its action. With that it drew off.

"Curse them!" cried Silvard. "That should teach them a lesson." Out in space were two formless masses of vapor. "Conductite bombs! You've heard of them, Brice?"

Brice was tensed and strained from the recent encounter. Angrily he wheeled to the pirate.

"You devil!" he cried. "You mean you've finished them?" He pointed to the two motionless masses of vapor.

"Exactly," returned Silvard, amused at Brice's anger. "Conductite bombs! That gaseous vapor penetrates the ether itself, and is a perfect conductor of heat. Shall I give you an example, something to illustrate this point? Very well, a wad of cotton is a pretty good insulator against an electric current. Soak it with brine, and what have we—

a perfect conductor! The metal of those spheres were good insulators against the escape of heat into the void, as was the vacuum within the inner walls. Soak it with a gas which penetrates the pores of the metal and what have we? A perfect conductor of heat!

"Every bit of heat within those spheres is conducted instantly out into space. It's just as if you stuck your finger into mercury. Your finger gets cold because the heat is conducted out. Every calorie of heat in those spheres is now disseminated out into space and the interior is frozen stiff, as well as every occupant!"

Hate and rage for this unscrupulous scientific fiend surged within Brice. He clenched his fists, strode a step forward.

Silvard laughed; threw back his head and roared heartily. At the first step two attendants had stepped upon either side of Brice, projectile guns pressing into his body.

"Take him out!" roared Silvard, motioning to his attendants. "Take him back to his cell. I'm beginning to tire of him."

## CHAPTER VI

### The Pirate Sanctuary

WITH the recent demonstration of Black Silvard's powers, Brice was quite willing to credit the man with being a genius. Back in his cell he paced the bare confines moodily. To save his life he could see no loophole to get him out of his predicament. The only satisfaction he could glean from the situation was the knowledge that Vallard was alive. That, at least, was some consolation.

Brice had no means of keeping account of time. In space there was no such thing as day and night, and sleep comes as often as fatigue calls and opportunity permits. His tired mind and

body were practically overdone, and Brice had slouched to a small cot in one corner of the room when a peculiar phenomenon presented itself.

The light within the room began to diminish suddenly. Since they were not within the influence of a planet this could not be caused by approaching dusk. The light came from a steady source, that of the distant sun through the single space-port in the cell. True, it could be diminished if the space ship altered its direction so that the port would be at a more oblique angle to the sun's rays, but neither was this alteration effected, for Brice felt no centrifugal force swinging him about. He knew that gravity was artificially maintained in the floor of the space ship, but as yet he was acquainted with no power which could divert centrifugal force on a turn.

His curiosity aroused, he hurried to the window. A strange sight met his eyes. Beyond was the black curtain of space, diademed by twinkling stars, while the flaring sun shone steadily in the far distance. But the peculiar thing about the scene was that every one of the tiny stars and the great sun itself had assumed a flat disc-like appearance. Instead of globular bodies they appeared to be merely thin paper discs floating out in the void.

And with every moment they were fading. A black mist seemed to be settling over the void. The illumination of the stars was fast turning into gloom, just as if the entire starfield was merely a painted picture and an electric light bulb had been switched off.

This unprecedented darkness descended swiftly, leaving Brice in a puzzled quandary. Ah—he had it!

The pirate ship was becoming invisible—it was going into its other dimension. He was instantly awake, his interest aroused. How many times had

the ships of the space patrol pursued the *Space Demon* till it faded into obscurity! And now he was to witness this phenomenon, at close hand.

Somewhat to Brice's disappointment, the impenetrable darkness which soon filled the room, remained constant. He could see nothing but inky gloom. As time passed and nothing happened he wearied. Finally he groped his way back to the cot. His brain was filled with turbulent doubts and speculations. Where, indeed, was Black Silvard's lair? His tired brain finally sought rest in slumber.

He was awakened by a flash of light which shone through the space-port into his eyes. Half-blinded, he found himself blinking into the glare of a distant, diminutive sun. Then the space-ship swerved and he felt it descending. A large leather-winged bird flapped up past the port-hole. Brice knew they were landing upon the surface of some planet. He hurried to the space-port.

The broad black expanse of a planet lay below. Directly within its center, like a jewel in an ebon setting, twinkled the tiny spires of a great castle which grew larger as the space ship descended.

A FAIRY city—out of the Arabian nights—a city of beauty, such as an aesthetic fanatic like Black Silvard might plan. It would take fortunes—but Silvard had fortunes. How else could he use the millions he had forcibly taken, except for personal enjoyment! Brice knew that below lay the lair of the space pirate.

Great hooded minarets, gleaming softly in the sunlight like carved bloodstone! Pure marble towers, crowned with balustrades and pinnacles! Artistic archways, beautifully carved, draped like the lace of a beautiful lady from building to building.

A picture of beauty, while beyond



the castle's edges, lay the strange foreboding planet of gloom! On closer observation Brice saw that the broad expanse rolled and tumbled into smooth hillocks which stretched into the distance. Its black hue was given it by the great growths of coral-like substance which formed a thick jungle over its surface.

At the great castle's lower base lay a lake, smooth and reflective as a mirror. Tended gardens and gravelled walks stretched about the lake. Yet it seemed strangely lifeless and unruffled. Then Brice saw the reason.

As the *Space Demon* settled down the lake moved! A large panel slid back into the hillside and revealed the black maw of a gigantic hangar. The lake was artificial, its upper mirrored surface a mere camouflage from above. Men appeared running about the edges of the hangar. As the great vessel slid down into the dark aperture and settled upon a cradle which lay ready for it, a gangplank slid from the darkness, projecting itself accurately to the broad back of the *Space Demon*. The great panel above slid back over them, and lights were switched on in the hangar itself.

Brice caught a glimpse of a landing platform, from which a great rampway led upward, and which was teeming with men. It was from this platform that the gangplank was extended.

So engrossed was Brice in the scene that he almost failed to hear the door panel of his cell swing open behind him. Two pirates advanced within, menacing him with their weapons. He was roughly seized and his arms bound behind his back. Then he was ordered to precede them.

A great doorway had been swung back in the side of the space vessel. The gangplank extended to the lip of this doorway. Under the watch of the

two escorting guards Brice was forced to walk up this gangway, and on up the rampway which led upward. He caught no sight of Black Silvard and naturally supposed he had preceded them.

The ramp-way leveled off into a corridor with many intersecting tunnels. The guards halted by a black unlighted flight of stone steps leading downwards.

"WHERE goes this prisoner?" questioned one of the guards, who was young, and looked as if he had had little enough experience.

The other cursed. He had withdrawn from his cloak a swinging torch lantern. At his touch a powerful beam of intense light spread from the lantern.

"To the bowels of the earth!" snorted the other guard in answer. "Where all carrion of his ilk go. To the pit itself."

Without more ado Brice was marched down a long flight of steps which descended into the cool earth, and still further down another black corridor. The lantern cast long shadows of his legs into the darkness before him. As they walked the corridor opened up into the light of the swinging lantern. The air grew cool. The stone walls were dank and covered with a green slimy moss. The floor was littered with dirt. A vile stench began to assail his nostrils.

Again descending, they came into a large chamber. The other wall of the chamber contained a large opening barred by a huge grilled gate. As Brice was marched past the gate he caught a glimpse of the shadows of the bars, stretching out on the floor beyond and reaching into a great circular amphitheater, whose circular walls were tiered with rows of iron cages set within the walls. Wild screams and cries of hate and rage came from the cages in mad cacaphony. It was quite evident that

Black Silvard already had many other prisoners.

Brice could already see how appropriate the guards were in calling this the bowels of the earth.

Leaving the great gateway behind, they ascended a short spiraling stairway, up past two landings. On the third they turned and followed a curving corridor whose inner wall formed the rear of the upper tier of cages in the arena. Round grilled apertures were empaneled in the doors which led into the cages. Through these apertures the maniacal faces of the prisoners could be seen, straining against the bars, while their shrieks filled the corridor.

The guards halted before one of the doors.

The older one extended the opalescent thumb ring which by some mysterious power acted as a key, and the door slid aside.

A moment later they had cut his bonds and flung him into the dark interior, shutting the door quickly behind him.

For a moment Brice lay where he had fallen. Dirt clung to his face where it had struck the floor. The darkness was only broken by the circular suffusion coming from the apertures in the doorway. A moment later, as the guard's footsteps died away, this illumination also vanished, leaving him in impenetrable darkness. With the mad cries reverberating in his ears, and the indescribable stench assailing his nostrils, Brice failed momentarily to credit his senses with all that which had befallen him.

Then, the mad reek rasping on his nerves, he rose and groped until he found the bars in the door, which he shook in insane futility.

In the mad discordance swelling about his ears his very rage seemed lost and insignificant.

## CHAPTER VII

### Bellen Seeks a Comeback

BELLEN was brutal and unreasoning by nature. It was a mistake made by Silvard in ever having included him in any of his nefarious schemes. But Bellen was a brother to Silvard's wife. Very opportunely, it appeared that Bellen had been a trader scout on Venus. For reasons best known to Bellen the earth had become decidedly unhealthy for him just before he signed up as a trader for the planet Venus. Thus it took no seduction on Black Silvard's part to surreptitiously slip a tiny radio set to Bellen, one which could be concealed upon a person, and yet one whose power extended indefinitely through the ether.

Kept posted constantly on the date the relief ships left earth, and the quantity of jewels accumulated, Silvard had found it easy to appear in the nick of time, overpower the trading post, and disappear with the booty. Bellen's part in the theft, had he known it, was insignificant to Silvard. But to Bellen's own primitive reasoning he was on a par with the pirate himself. Consequently, when the pirate refused to accept him as a social and mental equal, his anger was aroused. The incident in which Bellen had unknowingly trespassed into Silvard's sanctuary still ranked in his memory. Bellen's passionate nature affixed itself ardently to the memory of Valda's lovely face and figure. His instinctive reactions were childish but none the less real. Because she had been forbidden to him she had become all the more dear. Secretly, his thoughts dwelled upon her constantly, but he did not allow Silvard to guess this. He housed his emotions in a sullen countenance. When Black Silvard refused to make a payment of certain jewels for the service of having

betrayed the trading post, Bellen surreptitiously formed a dogged determination to find vindication.

Arrived at the castle sanctuary, Bellen was quartered with the ordinary pirates in a dirty, squalid section. Rough, coarse comrades in the pirates were readily found by him, but his greedy eyes turned only to the more beautiful section of the castle, with its lavish luxury, and the numerous Martian concubines belonging to Black Silvard. He took to trespassing the limits of Silvard's personal quarters, where none of the ordinary pirates were allowed, in the hopes of catching a glimpse of Valda. Much to his disappointment, he did not, but he did encounter his sister, Gwen, the wife of Silvard.

Once Gwen had been ravishingly beautiful in a passionate way. Now she had changed. Her face was lined with jealousy and strain. She had been pacing a tiny garden when Bellen ran into her.

"GEORGE!" had gasped the middle-aged apparition. "George Bellen!"

Hearing the long unused name Bellen recognized her instantly. Greeting her gruffly, he turned to pass on. Little love was lost between them. Then, acting upon some impulse to hear of her former world, Gwen had implored him to stay.

Presently he was pouring out his anger and wrath against Silvard. He told her of Valda, of his own drunken trespasses on board the space vessel, and the resulting objurgations delivered by Silvard.

"Valda!" spat Gwen, rage contorting her features. "God! I hate her, and him too, who pays tribute to her beauty."

"You hate him, too?" queried Bellen.

Her jaded, heavily painted eyes glowed with sullen smouldering fires.

"And should I not!" she cried tremulously. "Has he not forsaken me, who am his only lawful wife, for those accursed Martian wantons? Does he ever look at me, at the features he has ruined and cast aside? No. I hate him with all my soul." But the jealousy in her attitude belied this. "Also, I hate Valda. You love her. Very well, George, why not have her?"

"What do you mean?" asked Bellen.

There was a speculative glitter in Gwen's cold, emotionless eyes before she spoke. She seemed to be weighing Bellen heartlessly, as a chess player weighs the power of a playing piece before moving it.

"Just this," she cried. "I can arrange a tryst. A Martian maiden is simple and primitive, however beautiful. Romance and glamour appeals quickly to their passions. She will meet you clandestinely, and I shall arrange the meeting."

Bellen licked his coarse lips with a thick dark tongue. Would he dare? Yes! How he hated Silvard. It would be—his revenge. His piggish eyes were aglow with passion as he bade Gwen arrange the meeting.

As Bellen stole away from the garden retreat and back toward his quarters, Gwen remained motionless for a long time, gazing after him. Then she laughed harshly. She had no love for Bellen, even though he was her brother. And she hated Valda!—had long planned futile schemes for her death. If Silvard ever caught Valda in a tryst with Bellen he would kill them both, as he had promised. Very well! So it would be. Perhaps when Valda was gone, Silvard would once more look at Gwen.

With hands a little gaunt and a trifle withered, Gwen tugged instinctively at her features, striving to arrange them attractively. Then she too, full of her

scheming, forsook the garden retreat.

THE planet which afforded a resting place for the pirate sanctuary, rolled steadily and incessantly in space, just as all planets do. Finally the castle rolled around and began to enter the shadow behind the globe. In the dusk her temples coruscated like living jewels with the sun's last rays. And the planet rolled on.

Soon the castle was dark. Bellen stole from his quarters and cautiously retraced his way to the dark little garden. A muffled figure met him, detaching itself from the darkness. It was Gwen. She merely said "Come" in a hoarse voice and led him into a near by entrance. Travelling dark unused corridors and stairways, they finally had ascended to a high tower of the main castle. She halted before a closed doorway.

"Valda!" she whispered. "She is within."

Gwen turned to go.

"Wait!" rasped Bellen. "How am I going to get back down those corridors?"

"I shall come later," said Gwen, her voice dry in the darkness. "Then I will take you back." Bellen thought he heard a muffled note of hollow laughter as she vanished down the corridor. Disregarding this as absurd, he pushed inward upon the door, which was of the type which swings inward upon hinges.

Within, the room was dark. Forebodings smote him. The smell of perfume and musk assailed his nostrils. A sleeping chamber. He stepped within.

There was a startled cry and a movement from the darkness. A light snapped on. At a wall panel crouched Valda in her bedgarments, her eyes wild with fright.

"Who are you?" she cried. "What are you doing here?"

Bellen grinned.

"You know me!" he said throatily. "And you know why I came." He advanced toward her.

"Yes," cried the girl. "But why did you come? Silvard would kill us!"

Suddenly she screamed in terror. Her eyes, riveted upon some object behind Bellen, caused him to whirl. In the doorway stood Silvard, a thunder-cloud of rage. He was leveling a projectite gun. Behind him, a shadow of a grin on her features, was Gwen. Bellen did not speak a word. Gwen had led him into a trap.

With staccato barks the projectite gun hurled missiles of death into the screaming girl. Her body was riddled with tracery before she hit the floor, her scream dying in a gurgle.

Instinctively Bellen sprang. Silvard, intent upon killing the girl who had betrayed him, was slow. Bellen hit him with a huge fist. The pirate lurched backward, the bullets from the projectite gun rattling into the ceiling. Bellen sprang out into the corridor, kicked brutally at the falling body of Silvard. He heard the clash of weapons, a torch gleamed. About Bellen were a half-dozen of the pirates, holding their fire because of his close proximity to Silvard.

Like an animal at bay Bellen moved. Leaping backward into the room he dragged the unconscious body of Silvard with him, protecting himself from pistol fire. He slammed the door behind him. Then he shouted to the pirates beyond the door.

"HALT!" he screamed. "Or I'll kill Silvard. Don't dare open the door."

Bellen had no means of killing Silvard, since the latter's weapon had fallen outside in the corridor. That did not matter. Bellen was too engrossed in

seeking a means of escape to bother over the pirate's fallen body.

A single window was at the other end of the room. Parting the curtains from it he stared out. In the darkness he could dimly discern a balcony. Without hesitation he climbed out on the balcony.

In the dim light from myriads of stars in the velvet, black sky above he discerned an open courtyard below, a vast gulf beneath the balcony. There was no way to escape at either side. The wall was smooth above the balcony. Straining his eyes Bellen peered below, just as he heard the door of the room crash in and the startled cry of the pirates at finding their unconscious chief.

Dimly discernible below was a thin, arching bridge reaching out into the gulf of the courtyard, its one edge resting on a balustrade platform below.

Swinging by his hands from the balcony Bellen dropped. It was a long fall to the platform but he made it without mishap. Scrambling to his feet, Bellen raced out across the bridge, tiny and untrustworthy, which had been placed there merely for artistic purposes. It trembled beneath his feet. Giddy at the depths of unfathomable darkness at either side, Bellen stumbled on.

Behind him the castle was arousing. Masculine voices were calling. Feminine screams re-echoed. And lights began to flash, searching light beams cutting from the balconies downward on the face of the building, out into the darkness.

The bulk of the other wall of the courtyard arose suddenly from the darkness. An open doorway beckoned, Bellen raced inside into perfect darkness.

Halting here, he tried for several moments to regain his breath. Then he heard voices. A dull illumination began to permeate the gloom, from below.

Bellen saw that he was on a landing place in a flight of curving steps descending downward. A man was ascending the steps, carrying a light. Crouched behind the edge of the landing place, Bellen waited. The man went down without a murmur, when Bellen's huge fist out of the darkness hit him behind the ear.

Running swiftly down the steps Bellen progressed, unhindered, from landing place to landing place. Then the steps descended no more, and he knew he was upon the ground floor. A current of cool air led him to an open door. Cautiously he looked out upon a little garden. All was quiet.

Bellen started. He knew this garden. His rendezvous with Gwen! Now he knew where he was. Racing quickly, he headed for his sleeping quarters.

A mad thing to do. But they wouldn't look for him there till they searched the castle. He would be safe—for a while—until he could complete a mission for revenge which entered into his brain. His rage overpowered his fear, and he raced into his own room with a mad glow of anticipation in his eyes.

Snapping the light on he went quickly to a corner and drew forth a diminutive radio set. Once before had he used this set, to betray his fellow men. Now he would use it—to betray Black Silvard. Adjusting the set quickly to a space-length known throughout several planets as the terrestrial police call, he shouted hoarsely into the transmitter.

A moment later a tiny screen glowed. Upon it appeared the shoulders and face of an armed military Police Captain. As the import of Bellen's words smote his brain, the Captain became abruptly awake. Somewhere, in an office far away on the earth, he sat stiff upright and called to associates.

"You say you are at Black Silvard's

retreat!" he shouted incredulously from the tiny televiso screen.

"Yes," cried the half-frantic Bellen. "Yes. But I don't know where we are."

"Just a second!" snapped the Police Captain. "Our direction finders are automatically training upon the wave of your televiso set." Then a look of amazement came stark into his features and he fairly shouted the word into the microphone.

"Pluto!"

The sanctuary of Black Silvard was on Pluto, in their own planetary system, and furthermore in their own dimension. A planet far outside of the distant Neptune. Perhaps the outermost one of all.

It was within easy striking distance.

## CHAPTER VIII

### The Attack

TO an observer from another planet it would have seemed that a swarm of bees was rising from a point on the earth's surface and seething out into space in a straight line. Yet each bee was a speed-lined Police craft, a space-dart, manned by two young officers of the Space Patrol, and the point on the earth from which they were taking flight was a vast airdrome not far from Washington.

There was something of grimness and determination about these uniformed young figures, erect and lithe, stationed before the pilot-desks of each space craft. Mirthlessly their eyes stared straight ahead into the void as their vessels bore them at inconceivable speed through space.

At last they were to come into contact with the Space Pirate. At last Humanity was to be avenged.

Direction finders had trained upon the ether-wave emanating from Bellen's televiso set. No further communication had been received after the first mes-

sage, but accurate instruments pointed to the approximate latitude and longitude of Black Silvard's retreat on the black planet of Pluto.

In the foremost space-dart Captain Drimmer carefully studied his charts. Through radio communication he controlled the entire armada of space vessels. Under his direction it moved like a flock of geese across the firmament and pointed unhesitatingly toward the retreat in which they hoped to corner Black Silvard at last.

Before they reached Pluto Captain Drimmer gave a brief order. His space-dart swooped suddenly and circled out in a great circle, leading the other vessels until they formed in a great ring. Then, like an aura of cosmic proportions the ring settled down over Pluto, forming a diminishing circle which closed off the Space Pirate's avenue of retreat.

"Gentlemen," said Captain Drimmer to the staff of officers who surrounded him in the control room of the lead ship. "For half my life have I awaited this moment. I am going to destroy Black Silvard if it takes every one of my ships."

The vast circle of ships closed down upon the planet. Presently the castle of Black Silvard lay completely surrounded by a great circle of maneuvering ships. A group of the space-craft detached itself from the ring and sailed directly over the castle. Simultaneously and without warning each ship dropped a very explosive bomb.

In the rumbling explosion which followed the castle shook to its very foundations. Clouds of dust and debris arose, a spire here and there crumbling in the clouds of flying particles.

"CEASE firing!" commanded Captain Drimmer. Then into a televiso set trained upon the scene below, "Black



Silvard, you might as well come out of your hole. We have you and you might as well save the needless bloodshed of your men!"

For a long time there was no answer. The dust and debris had settled below and was being observed by the Space Police through powerful glasses. Through the shambles of death already created could be seen the running figures of the pirates, fearfully seeking cover from the menace from above.

Then the televiso-scene cleared and Black Silvard was staring wrathfully into the face of Captain Drimmer.

His eyes were wild, his hair awry. One of his fists strained white on the hilt of a half-drawn sword.

"The Space Police!" he snarled.

"Exactly," answered Captain Drimmer triumphantly. "Black Silvard, we have you at last!"

Under the lowering brows of the space pirate his eyes were gleaming like those of a cornered beast. He was panting in rage.

"Not yet!" he rasped. "You fool, you haven't got me yet!"

A sudden suspicion crossed Captain Drimmer's mind. Did Black Silvard have some subterfuge of escape planned for just such an emergency? The thought made the Captain wince inwardly. He turned to the microphone at his side.

"Prepare to fire!" he ordered briskly. "Loose every ounce of destructive power at the word I shall presently give. Destroy everything below!" Then he turned to Black Silvard. "You see how it is," he said unctuously. "Do you surrender?"

A crafty expression came into the cornered pirate's eyes. He seemed to be debating the question.

"Yes," he cried. "You have the upper hand. Yet it would be worth your while to consider my proposition. Will

you promise to have mercy upon me and my men?"

"Mercy!" gasped Drimmer. "You—would ask for mercy!"

"We have in our possession a group of terrestrial prisoners. They also will be destroyed should you loose your fire upon us. If we turn them over to you, will you promised mercy to us in the end?"

Captain Drimmer considered the proposition for several moments.

"Don't fool with him!" broke in an impetuous under-officer. "There's something back of all this! Destroy them without compunction!"

"But we have to consider the earthmen who are prisoners," said Captain Drimmer. "Yes, Black Silvard, if you turn over your prisoners to us we shall see what we can do in the way of mercy!"

"Then I surrender!"

The Space Pirate withdrew the sword he held in his hand and dropped it to his feet in a gesture of defeat.

"We will march the prisoners from the castle to the edge of the lake," he said. "Let a single space-craft descend and pick them up. Then we will disarm ourselves and surrender."

With that he faded from the televiso screen.

"It looks suspicious, I know," Captain Drimmer said to his under officers. "Logically, Black Silvard will only surrender to death if he plays the part he has been playing. But under the circumstances what is there to do?"

The officers again trained their glasses on the scene below. Between the castle and the lake a vast concussion had torn deep into the ground, forming a debris-filled crater. From the castle and around the crater to the lake's edge the prisoners would have to be marched.

A space-craft of the Police patrol prepared to descend, wary of a trap.

Not until the prisoners were safely deposited upon the lake's shore would they descend. A fox was trapped in his den. And a fox is only the more cunning when at bay.

Captain Drimmer watched for action below with a worried expression.

## CHAPTER IX

### The Fight for Freedom

FOR an infinite length of time, or so it seemed, Brice Burney had lain a prisoner in the cell below the pirate's sanctuary. Numberless times had food been brought to him, but having no means of judging the interval of times between meals he was at a loss to determine the exact number of days he had been kept prisoner. Every time the guard appeared, displaying a light and carrying food, the corridors of the prison rang and reverberated with mad cacophony, which did not abate until the guards were gone.

Then suddenly there was a terrific concussion and Brice was thrown to the floor. For a long moment he lay stunned. He picked himself up, his ears ringing. Some explosion, the meaning of which he could only conjecture, had occurred somewhere within the basements of the castle.

The cell continued to quake and rumble for some minutes. Finally it quieted.

It was merely a signal for mad pandemonium in the cells. The prisoners, crazed and half-frightened, departed momentarily from the last vestiges of their sanity and gave vent to their feeling in long drawn howls and screams. Brice himself felt that he must be going mad.

Finally a dull trickle of light appeared and the quick footsteps of many guards sounded. The doors of the cells began to clang open. Brice heard the prisoners being ordered hastily out. Soon his own turn came and his own door

swung aside. A line of armed guards stood outside. Something of the tenseness of their features was communicated to Brice.

Something unusual was afoot. Why otherwise would all of the prisoners be liberated simultaneously? Was it a trap?

Brice had no time for conjecture. Hastening the prisoners with sharp points of swords and spears the guards marched them back up the corridors whence they had come. At the veering of the passageway where it swung toward the secret launching place of the *Space Demon*, the guards proceeded more slowly. A terrible explosion had burst somewhere above or within the passageway. It was completely blocked up with fallen debris. Marching the prisoners up a corridor strange to Brice, the guards escorted them out into the blinding glare of the light.

It was truly an amazing spectacle for the poor prisoners. They stood within a scene of destruction. Tottering buildings leaned about them. In the courtyard within which they stood were pockmarks of shell craters. Lying here and there were bloody and torn bodies. And swarming above—Brice could hardly believe his eyes—were the darting craft of the Space Patrol.

A dark-cloaked figure hurried from a passageway and joined the guards.

"Black Silvard!" ejaculated Brice, recognizing him. The pirate made no hesitation, but gave crisp orders to the guards. A moment later the guards had turned the prisoners from the courtyard and were marching them down a flight of steps leading out into the open. Below them, across a crater formed by a bursting shell, was the mirrored surface of the imitation lake. Skirting the great crater-hole, the prisoners approached the shore of the lake, just as

a space craft from above began a slow descent.

MEANWHILE, Black Silvard was acting in a peculiar fashion. He had drawn the cloak about him in a disguising fashion and had hurried amongst the prisoners. It looked to Brice as if Black Silvard was trying to escape detection from above. Suspicious, he sidled over to the pirate, watching him closely.

Thus it was that he was just behind the space pirate, when the group reached the shore of the imitation lake. He saw Black Silvard stoop and grasp a small steel ring projecting from the sand. A moment later a trapdoor opened revealing a ramp leading downward. With a swift glance around to see if his actions were watched, Black Silvard scuttled down into the darkness below.

Brice, his suspicions aroused, was right on his heels. He narrowly missed the trapdoor as it swung back downward. Stepping blindly into the gloom he collided with Black Silvard.

There was a hiss of indrawn breath as the pirate wheeled, like a beast at bay. A knife glittered yellowly.

Instinctively, Brice shot his fist out. It caught Silvard's arm, sent the weapon spinning into the gloom of the stairway. A moment later they had grappled. Stumbling in a death embrace they fell down the darkness of the stairway. With the sharp projections of the steps bruising and mauling their falling bodies, their hold loosened. After a somewhat dazed flight in the darkness Brice found himself lying almost insensate upon a dark landing. Staggering to his feet he was just in time to see the fleeing figure of Black Silvard dart down a great rampway.

In a moment Brice was in hot pursuit. He had lost sight of the pirate around a turn in the rampway, but coming out

upon a greater landing he suddenly found himself in the great hangar which housed the *Space Demon* below the imitation lake. Racing across the gang-plank toward the great hulk of the space vessel was the speeding figure of Black Silvard.

Not pausing, Brice flung himself after. Upon either side was the gray gloom of depths; before him the gang-plank ended on the lip of the yawning doorway. Black Silvard had already disappeared within, and the panel was sliding to. Flinging himself headlong into the diminishing doorway, Brice was just in time to avoid the door as it slid securely shut.

Hesitating on the sill of the great hull Brice stared into the gloom, seeking to accustom his eyes to the deeper dusk. He could see nothing. As far as visible evidences were concerned Black Silvard might as well have vanished. His own heavy breathing sounded harsh in his ears.

The control room! Of course! Black Silvard would be there.

Unfamiliar with his surroundings, Brice found it a difficult task to reach the conning-tower control room. Venturing from one door to another he gradually made his way upward. Then he reached the lavish upper apartment. It too was deserted. But now he was on familiar territory. He remembered the way to the conning-tower now.

Suddenly he staggered and was flung to the floor. The floor rose and met his body. His weight was multiplied enormously, and the sickening realization came that the *Space Demon* was in flight.

By exerting superhuman strength Brice managed to crawl to a stooping upright position. Lumbering as awkward as a great ape under the acceleration of the speeding space ship he crawled up the rampway and into the conning-tower.

As he staggered into the threshold he could see the control dials and bulbs glowing. Otherwise the control room seemed vacant. Then a club descended upon Brice from behind. He slumped to the floor in oblivion.

\* \* \* \* \*

**P**EERING through his glasses at the scene below, Captain Drimmer had sighed with relief.

"Well," he said. "It looks like everything was on the up and up."

Down below the prisoners were lined up preparatory to filing up the gangway into the craft of the police patrol.

"My God, sir!" cried an under-official wildly, grasping the Captain's arm and gestulating downward. "Look at that! Why, those guards are—"

His excited sentence was unfinished. The guards escorting the prisoners had drawn back from the space craft. Suddenly, as one, they withdrew projectile revolvers from their clothes and leveled them at the prisoners. There was a thunderous detonation as many projectile guns barked at once, and the prisoners crumpled and swayed into dying heaps before the very gangway. A shell screamed from a concealed position within the castle. The police patrol craft seemed to burst into flying fragments. Black Silvard had promised to deliver the prisoners safely, but secretly he had given orders for their demise.

"Crossed!" exclaimed Drimmer. "Crossed, by God!"

He had opened his lips to shout an order to his ships to fire. His words died in his lips, and his mouth remained open in surprise. For the serene lake below had suddenly changed. A black aperture was appearing as the huge panel slid back. A moment later a great broad hulk hurled itself upward from the hangar within the imitation lake.

A juggernaut of destruction, the

*Space Demon* crashed her way upward through the circle of surprised police craft. Buffeting the ships left and right the *Space Demon* emerged into space at a terrific pace.

Recovering his self-possession, Captain Drimmer gave rapid orders. Half of the police planes detached themselves from the circle above the castle and swooped swiftly in the wake of the "Space Demon." The other half remained. Already their shells were dropping in rapid order downward, their rays focussing below; a merciless destruction was concentrating on the crumbling ruins of that which had once been a luxurious castle-retreat, and which was fast becoming but a lifeless pile of smoking debris.

\* \* \* \* \*

**W**HEN Brice returned to consciousness his head was throbbing from a bruise over his ear, from which wound blood trickled over his cheek. He was lying on the floor of the control room, his arms bound tightly behind his back.

Black Silvard was stooping over the controls, turning his head sidewise and peering like an owl at the large televisior screen.

It was only then that Brice felt the acceleration of the moving space ship. Within the televisior screen spread the images of the pursuing space patrol ships, while Pluto loomed tiny in the background. The "Space Demon" had burst through the police patrol. Now there was ensuing a wild flight through space.

Brice managed to gain a sitting position, but his labored breathing was so audible that Black Silvard spun round.

Rage inconceivable swept his dark face. His lips were drawn back in a snarl. Brice, feeling that the police patrol were in fast pursuit, could not resist a feeling of elation.

"A chemist to catch a chemist!" he cried. Silvard writhed.

"Brice," he shouted. "Did you reveal my sanctuary? Somehow, my secret slipped through. D———, did you radio the Space Police?"

Brice shook his head.

"You lie!" raged Silvard fanatically. "A filthy lie! Brice Burney, I am going to kill you—horribly! Just now—I haven't time! But when we have escaped, I shall tear you to bits at my leisure! You hear me?—By God—it's a promise! I swear it!"

"Escape!" scorned Brice with a contempt he did not feel. "Escape! You fool, there is no escape. Look!—watch the police patrol in the visor screen! See—they enlarge—they come closer! Black Silvard, your day has come! There shall be no escape!"

The Space Pirate threw back his head and laughed. His eyes were blood-shot and mad, the mouth twisted and raging, and yet demoniacal mirth came from his lips in staccato bursts.

"Yes, look at them," he cried, pointing to the images of the nearing space patrol. "Look!—they come closer! But—my chemical fool, do you think I depend on mere speed alone to escape! How do you think I have avoided my enemies! How do you think the *Space Demon* has been invincible so long?"

"I do not depend upon speed, Brice. I depend on the opposite force, the force of motionlessness! A secret of nature which makes the *Space Demon* invulnerable—motionlessness!"

"Motionlessness!" echoed Brice. The man was crazed. Brice knew it—and yet— Had not the *Space Demon* become invisible time and time again? Had not it always eluded its pursuers!

"Closer! Ever closer!" raged Black Silvard, peering into the televisor. A brief five minutes—they would have overtaken me—but no—it shall not be.

Brice, you are a physicist! You will be interested in seeing my escape. Watch!"

Black Silvard strode to the small pedestal in the control board and wrenched free the hood. Seizing the lever empaneled there he threw it.

A dream! Yes, surely it was a dream! Brice lying there bound, a maddened man alone at the controls. In the televisor a swarm of the space patrol—closer—closer! And out through the transparency of the coning tower, the jewel-besprinkled curtain of the universe.

Fists clenched and body tensed like a panther prepared to spring, Black Silvard was peering into the visor and cursing the pursuing police vessels.

"On, on, you dogs!" he raged. "Closer, till you see the very rivets on the hull! But you shall never take me—never—you hear! NEVER!"

A madman! Cursing at a fate pursuing him. And still those police craft became larger in the visor. Brice could even see the strained faces of the piloting police staring through the ports.

And then—Brice looked about quickly. What was that? A step from behind. With a pounding heart Brice saw a figure steal into the control room, tiptoe toward the cursing pirate whose back was turned.

He had thought that he was alone upon the space ship with Black Silvard. Now there was a third person. Who? The great bulk was unmistakable, the simian lurch distinguishing. It was Bellen!

Some inner instinct warned Black Silvard. He spun, but too late. Bellen was covering Black Silvard with a projectile revolver.

"BELLEN!" Black Silvard spat the word out. A sudden dawning recognition lighted his face. "You traitor! You—who radioed the Space Police!"

"Yes," snarled Bellen triumphantly. "I

gave away your secret. Silvard, damn you, I always hated you. There ain't nothing going to stop me now. You'll be sorry you didn't give Valda to me in the first place. I radioed the Space Police with the same set you gave me to betray the Venus Traders! Then, with your cutthroats on my trail I sneaked out and hid down here in the Space Demon. Well, I've got you now, and I think I understand the situation. I'm going to turn you over to the Space Police. Back up—you devil, I'll be glad to fill your guts with hot slugs!"

Silvard backed up apprehensively. He suddenly laughed.

"Bellen," he said placatingly. "You and I should be friends. We'll take it through together. Put down that gun."

"Never," spat the hulking giant. "I've got a chance tu' save my own hide and return to earth! With you I never could! I'm going to slow down this ship and turn her over to the Space Police."

Suddenly a blaring trumpet voice spoke from a megaphone.

"Halt!" commanded a voice. "This is Captain Drimmer speaking. In one moment we will be in firing distance. Then we're going to let loose and blow the *Space Demon* to smithereens."

For a moment Captain Drimmer's face became superimposed on the televisor. He took in the scene at a glance.

"I've got 'em," cried Bellen triumphantly. "Captain, if I slow down the ship will you issue a pardon for me?" Drimmer promised.

Brice's eyes were fastened on Black Silvard. The man was chuckling. A light of triumph was in his eye.

"Get back there, Silvard," ordered Bellen. Menacing the pirate with the outstretched gun, Bellen advanced to the controls.

Meanwhile Drimmer's face faded and a view of the pursuing space ships again was on the screen.

But suddenly the ships seemed to dwindle, to fade into the distance. Silvard was still chuckling.

"Escape!" he chortled. "Escape! Yes, Bellen, escape is inevitable! You can never turn me over to the Space Police! Never! We are moving—into the dimension—of motionlessness!"

Bellen had grasped the controls and was staring wildly. Futilely they swung in his hands. He grasped the lever Silvard had thrown upon the pedestal!

"Useless!" taunted Silvard. "The controls are useless!"

Bellen was staring with fright at the televisor. The space patrol vessels were dwindling now into the distance. He jumped to confront Silvard.

"You—" he raged. "What have you done to it?"

Silvard laughed, even in front of the menacing projectite gun.

"What have I done!" he cried. "Look, you fool! Look about you! We are progressing into another dimension! Into the dimension of motionlessness! Look, Bellen! The stars! The stars!"

Brice at first thought it was an attempt to divert Bellen's attention. Then he stared!

Beyond the transparency of the conning tower the firmament had changed. The stars had changed from spheres to tiny discs floating corpuscle-like in the void. The distant flaming sun, too, seemed but a disc of gold-foil suspended in the void.

Again Brice remembered the darkness which had descended upon the Universe and this same phenomena which he had witnessed in the cell room of the *Space Demon* as he had been held a prisoner.

"Motionlessness!" Black Silvard was crying. "Brice, you should be interested! Yes, your fate will interest both of you! It will please my fancy to ex-



plain the invisible power of the Black Demon now!

"LISTEN! Have you ever heard that the entire cosmic creation is drifting at space at an unheard of pace! Of course! Our very universe is speeding, passing space just as the picture flashed on a moving picture screen passes the fabric of the screen behind. Then think—what if our vessel is suspended motionless in the absolute space. Then moving space, or the relative space carrying our universe, will speed away from our motionless vessel!

"That is my secret! It is merely that I succeeded in gaining immobility! Have you ever seen a minnow swim upstream in a brook and keep itself motionless with reference to the bank!

"Very well. Our space ship is the minnow, and the cosmic drift is the brook!

"In brief, that is my secret. I have learned to guide the *Space Demon* in such a direction and at such a speed that it counteracts the cosmic drift and remains motionless while the universe flows on."

For the moment the scientist within Black Silvard had gained supremacy. Again he was a lecturer, proudly displaying his knowledge, his powers gained through delving into science. Brice felt the genius which surged within Black Silvard, felt the power of the other's mentality. For a moment he forgot that he lay a prisoner, that Black Silvard was menaced with a projectite gun. He forgot the despair of the knowledge that the *Space Demon* had eluded the Police Patrol by some inexplicable power.

It was a scientist speaking to a scientist who spoke. An elusive vision of unheard-of possibilities swept Brice at Silvard's words.

"Motionlessness!" he gasped from his

position on the floor. "But how does that explain—the stars—the sun?"

The stars outside were but mere shimmering sheens, discs of unbelievable thinness, and the sun itself was a jack-o'-lantern, a phantom disc rushing toward the *Space Demon*.

"Lorenz-Fitzgerald Theory!" cried Silvard triumphantly. "Have you ever heard of it? When a body gains speed it contracts in the direction of its motion until at the speed of light it has contracted to a zero thickness!"

"But what has that to do with the stars shrinking?"

"My dear Brice. Really, your brain is infantile? Can you see how the *Space Demon* has gained immobility by swimming against the cosmic stream?"

"Yes—of course."

"And, since we were immobile, the moving universe still swept the Police Patrol along. Not having guiding instruments as delicate as my own it would be impossible for them to attain similar immobility! Very well—

"Fitzgerald proved that with increased speed there came a contraction in the direction with which we are moving.

"Then think! What of all the motion already given to the Universe by the cosmic flow? Is it not already contracted to a great extent? Very well—when the *Space Demon* gained immobility it lost all of this speed; naturally it lost all of the contracting effect of the Fitzgerald theory.

"Do you see! The stars are not shrinking! No! Instead, it is the *Space Demon* which is expanding to its normal size. The stars seemed to shrink because we too are expanding with relative speed to the *Space Demon*. Since this expansion is relative it is not apparent with comparison to ourselves.

"But the contracting effect is yet apparent on the Universe, which sweeps

about us even now at great speed, while we lie motionless."

It was a revolutionizing thought. The *Space Demon* expanding—growing larger than objects of the speeding Universe.

Very little of this had seeped into Bellen's thick skull. His mind always on the practical, he crouched back in terror at the forces he could not understand. Suddenly he shouted a warning. Seizing the controls of the space ship he manipulated them. Empty and futile, they swung about in his hands. The course of the ship altered not a bit.

And bearing down upon the *Space Demon* was the fiery disc of the sun.

"WE'RE going to crash!" screamed Bellen, flinging a protective arm before his face. "We're going to crash! Silvard—steer us out of here!"

Silvard chuckled and shook his head. "Impossible!"

Bellen brought the projectite gun about and trained it on the Space Pirate.

"Damn you!" he shouted. "You got to save us!"

Silvard made a deprecating gesture.

"Impossible!" he returned. "Did you ever hear of Einstein's theory of the gain of mass with speed. As an object approaches the speed of light it gains mass until at the speed of light its mass is infinite! Very well—

"As an object loses speed it loses mass. At immobility all mass is lost! Don't you see! At the speed of light an object contracts to nothing and has infinite mass! At immobility all mass is lost and it expands to infinity!

"For long science has recognized that speed and mass are identical and cannot be distinguished, but are merely differing manifestations of the same energy or force. Remove speed and you remove mass. Add speed and you add infinite mass.

"When we gained immobility all mass vanished. Do you know how the *Space Demon* is propelled through space? Gravitational screens concentrate her gravitational pull in a given section of the Universe! But what if we have no mass! Then gravitational pull is useless!

"No, the ship controls are futile! Our mass is gone, and our gravitational screens will not function."

Bellen was cursing! Like a roaring meteor the disc of the sun expanded, swept toward them! A fiery disc, of paper thickness! Death!

So unreal was the scene that Brice could hardly credit his senses.

A space ship expanding—losing motion—and mass! A space ship!—helpless and motionless in mid-space, while a Universe swept on. And the cosmic flow was hurling the sun onward—straight for the *Space Demon*!

The sun's disc seemed to burst—to inflate like a bomb bursting at night—to encompass the very universe in its blazing expansion! Brice writhed and tugged at his bonds! An instant more!

## CHAPTER X

### Relativity to the Rescue

"DEATH from the sun!" ejaculated Silvard contemptuously. "Absurd! Relatively we are in another dimension now!"

For the sun, other than blinding them momentarily, had not harmed them.

"Remember," continued Silvard, "that we have expanded an unmeasurable length. The sun is infinitely thin compared to us. Perhaps its entire thickness was no more than a small portion of the distance between the electrons of our body. Thus we passed through the sun unharmed!"

At last Brice understood the strange power which had kept Silvard invulnerable to the Space Patrol. Vanishing into

this dimension of motionlessness and infinite expansion he had merely waited until the Space Police had been swept by and then returned to the earthly dimension.

Return!—but how! Suddenly Brice's brain was racing! Speed—motion—mass! Einstein! Heavens—

Black Silvard was eyeing Bellen stealthily. Outside, the universe was fading to a black gloom. Soon it would be entirely gone! In the darkness the pirate might creep on Bellen.

But there was genuine fear in Black Silvard's eye as he stared at the projectile gun held in the hand of Bellen. Not just the ordinary fear of death! Another reason!—and Brice suddenly knew what.

Far behind them he knew the space police still pursued doggedly. The *Space Demon*, gaining immobility, had eluded them. The police craft, fluttering against the cosmic drift, were slowly losing headway, but—

If the *Space Demon* could again be brought into the world of mass, it would be fatal! The space police would quickly overtake her!

Expanding! Soon the blackness of the other dimension would descend! Then in the darkness Silvard would creep upon Bellen! Brice's brain raced madly.

Motion and mass! With the addition of speed comes the addition of mass. *No wonder Black Silvard feared the speed of the bullet of that gun!* The great speed of the electronic discharge!

Brice's hands were bound, but he struggled to his feet.

"Bellen," he shouted. "Damn you, I'm going to kill you, Bellen."

He lurched forward awkwardly. Bellen stared in surprise. He had expected no antagonism from a bound unarmed man. However, seeing Brice advance upon him, he drew up the gun.

"Back!" he shouted. "Stand back, there, or I'll kill you!"

Black Silvard was suddenly flaming with wrath.

"Bellen!" he shouted. "Don't shoot that gun! Don't shoot that gun!"

It was plain that Silvard was afraid to advance for fear Bellen would turn it on him.

With a taunting shout Brice lowered his head and charged straight for Bellen. The great brute frowned. With a curse he swept the revolver about. A stream of staccato bullets tore through the conning tower.

Brice felt the hot fires ripping through his shoulder, heard the bullet ricochet about the room, bouncing from the curved glassite walls. Speed—mass! He slumped to the floor, a grisly grin on his face. Screaming with rage Black Silvard leaped upon Bellen. Brice's last conscious vision was of them, battling for possession of the weapon.

\* \* \* \* \*

THE rays of the sun were slanting down through a broad window into the hospital which overlooked the Potomac. A white-garbed nurse in immaculate attire tiptoed over and raised the curtain, allowing a suffusion of light to illuminate the sanitary hospital room. She looked rather apprehensively at the man who lay quietly upon the bed. He now lay quiescent, staring up at the ceiling, but a moment before he had wrestled and tumbled in his sleep just before he awakened.

Brice had, in those few moments before awakening, been reliving those madly exciting moments when he had thrust himself upon Bellen and caused him to shoot in the conning tower of the "Space Demon." That had been a month before. The unconsciousness which had crept into his insensate body as he slumped to the floor of the

conning tower had held him in oblivion until he had awakened restlessly in this hospital room. He could remember interminable days of fever, of terrible dreams, of a brain in turmoil throbbing within his skull.

And finally had come peace, though his shoulder was stiff and trussed in thick swathes of cloth.

A buzzer sounded, and the nurse now spoke into a transmitter by the bed. Then she turned to Brice and smiled sweetly.

"Do you think you could receive a visitor?" she queried. "Captain Drimmer." Brice cleared his throat and acquiesced emphatically.

And in a moment there was Captain Drimmer, sitting stiffly in a chair beside the convalescent, his eyes wet with tears of joy. With a triumphant inner light in his face he conversed happily over the conquest of Black Silvard, which had resulted only after the heroic endeavor of Brice himself. Brice was awakening to find himself a national hero.

"Yes," complimented Captain Drimmer. "It was a master stroke of genius, that thought of yours. We saw the *Space Demon* fading as it raced, or seemed to race, toward the sun. We kept falling behind, but we kept on the trail. We found the *Space Demon* floundering out in the space beyond the sun.

"Took her without a struggle, we did! Yes, sir! Just towed her in to earth as meek as a new-born lamb. Then we burst in!

"Well, you know what we found. Black Silvard dead as a nail, shot through the head by Bellen. Bellen himself we took prisoner! He was willing to give up! And you yourself, a-lyin' there just like a corpse! I can't understand it though, darned if I can—"

"What's that?" asked Brice, smiling. "What can't you understand?"

"Why—the *Space Demon* coming back to this dimension and all—you know."

"That was easy," said Brice. "You must understand that I really had a good education—just as good as Black Silvard's himself. I understood the natural laws of physics. Naturally I understood Black Silvard's secret. The man was really a genius, but his one mistake was his love for bragging. When he revealed the simple laws which governed the *Space Demon* in immobility, he really revealed the means of escape. Had I not been suddenly illuminated with this simple counteraction to motionlessness I would never have forced Bellen to fire the gun."

"I know," agreed Captain Drimmer. "But what was it about that bullet which caused the *Space Demon* to be brought back to our own dimension?"

"ONLY this," explained Brice. "The *Space Demon* was suspended immobile in space, while the Universe swept around it. She had lost all mass, thereby becoming intangible to our universe, and to the pull of gravitational attraction. But—

"With motion comes mass. The bullet from Bellen's gun was traveling at an enormous rate of speed. *Mass was thereby generated in the bullet!* The pull of the universe was manifest in each bullet. Slowly but surely the mass attraction of the Universe upon these bullets swung the *Space Demon* out of perfect immobility!

"Swaying rather gently at first, the space ship began to drift with the cosmic flow. As it drifted, it gained speed, and mass! As it gained mass, the gravitational pull was multiplied and the universe tugged harder than ever at the mass which was the *Space Demon*.

"Soon it was swinging back with the

cosmic flow. With speed, it contracted in accordance to Fitzgerald's theory, thus becoming tangible again to our earth.

"Now, in the ensuing struggle I was shot and Silvard was killed. Had he not been he might have brought the 'Space Demon' back to speed and again counteracted the cosmic flow, thus opening again the portals to this other dimension of motionlessness."

"Oh, no, he couldn't have!" objected Captain Drimmer. "Because we were on

the scene before he could ever have thought of gaining enough speed to counteract the cosmic flow.

"But say, Brice," he continued. "What was—that there theory again?"

"What—Einstein's?" queried Brice goodhumoredly. "Mass increases with motion. Very simple, is it not?"

"It is not!" asserted Captain Drimmer. He went out of the hospital room mumbling the words to himself and shaking his head.

### THE END

## Science Questionnaire

1. What guns may be taken as the predecessors of rapid-firing pieces? (See page 10.)
2. Who made the first design for a parachute? (See page 11.)
3. What is the scientific name of the boll weevil? (See page 12.)
4. What is the scientific name of the mosquito that is a carrier of infection? (See pages 14 and 21.)
5. Does every such mosquito cause disease? (See page 14.)
6. How far does a malaria-bearing mosquito travel in a day? (See page 21.)
7. How may spectroscopy be defined? (See page 31.)
8. If all matter in space were brought to rest, what would happen? (See page 31.)
9. What proportion of the sun's radiations of heat and light is received by the planets and satellites of the solar system? (See page 42.)
10. What is the solar constant and what is it equal to in ergs? (See page 44.)
11. How is the rate of solar radiation affected by sun-spots? (See page 44.)
12. What is the etymology of the word psychoneurosis? (See page 68.)
13. What is the composition of the atmosphere of the earth? (See page 68.)
14. Under what conditions might a man be subject to high acceleration and not feel it? (See page 86.)
15. What aspect of the sun might we expect to be visible when out in the vacuum of distant space? (See page 88.)
16. Can the atmosphere's condition interfere with astronomical observations? (See page 95.)
17. What is the name of Mar's outer satellite? (See page 96.)
18. Does it rank as a large or small body? (See page 96.)
19. What planet is far out in space from Neptune? (See page 123.)
20. What is the Lorenz-Fitzgerald Theory? (See page 129.)
21. How is it related to relativity? (See page 129.)

# *In the Realm of Books*

Conducted by C. A. BRANDT

**THE GOLDEN HOARD.** By Edwin Balmer and Philip Wylie. Frederick A. Stokes Company, 443 Fourth Avenue, New York. 323 pages. \$2.00.

The names Balmer and Wylie have a good sound in the ears of every science fiction reader, for having written the two magnificent books "When Worlds Collide" and "After Worlds Collide." I hope that it will be of interest to our readers to know that this team of Science Fiction Maestros, excels also in other literary fields and has written a corking good mystery yarn. From our point of view, *i.e.*, the scientific one, the story is just passable, but I hope that, if these two authors observe a continued interest in their works among a distinct group of readers, it might induce them to give us another chronicle of what is happening to the survivors of "When Worlds Collide" on Bronson Beta. May Allah guide their minds and pens into the proper thought channels.

The "Golden Hoard" deals with the everlasting depression and its effect on gold. One Horace Denslow, an aged crank is getting panicky about the sinking dollar. He changes all his wealth, also stocks and bonds (known as "Securities" several years ago) into gold. This gold he transports secretly by plane to his estate in Georgia. His confidential attorney, Prescott, learns of a plot to rob and kill Denslow while the plane is in the air. Prescott tries to foil the plot but all in vain; both Denslow and his pilot are murdered, and the vast quantity of gold disappears. Young Denslow, the heir to whatever can be recovered starts to solve the mystery. He is encouraged and helped by his fiancée Linda Telfair, a southern beauty. Through scraps of paper, on which were written peculiar quotations from the Bible, Linda gets a clue and finally the better part of the gold is recovered hidden in artificial cement boulders. The murderer gets his due punishment and everybody is happy. The best thing in the book is the very cleverly worked out cipher disguised by Bible quotations. As a mystery story, The Golden Hoard is on a par with the best of them.

**THROUGH SPACE AND TIME.** By Sir James Jeans. The Macmillan Company, 60 Fifth Avenue, New York. 224 pages. \$3.00.

In some of his previous books Sir James has been somewhat severely technical, particularly so in "Our Expanding Universe," which contained enough mathematical formulae and equa-

tions to last anyone for a couple of lifetimes. In his present book however, all obnoxious mathematics shine through absence, and Sir James shows extraordinary literary ability by making science understandable and fascinatingly interesting to everyone. Sir James being one of the most famous physicists of our times has achieved something wonderful in presenting the enormous mass of well known facts about the sun, the earth, the stars, etc., in a well condensed comprehensible form. Though the book contains nothing new in fact or theory to the astronomer or physicist, it is written with such lucidity that at least nine out of ten will be able to enjoy it and derive a great deal of scientific knowledge from it.

"Through Time and Space" is a book on scientific travel, a sort of travelogue. Sir James takes us on a trip all over our beloved earth. Though we do not see any scenic wonders, we learn that the earth is a sort of spinning ball and that it travels around the sun which itself is travelling with his planet children at prodigious speed through space towards a certain constellation. Incidentally we learn a lot about geology—the interior of the earth—the historical records left in the rocks—the development of life from protoplasm to man—and we also learn something new about more familiar phenomena like the colors of the sky at sunset and the rainbow. The aurora borealis is not forgotten either. Sir James takes us to the valleys and mountains of the moon, to the various planets—Mars, Venus, Jupiter, and also to the Sun, where we learn things about temperatures, coronas and sunspots and their relations to life on earth. Then he takes us to the stars and further yet to the unthinkable distant nebulas.

I understand that, in the Royal Institution of London every year in December, series of popular lectures are delivered by various distinguished scientists and that this book contains the lectures, somewhat embellished and amplified, as they were delivered last year by Sir James Jeans.

It is impossible to do justice to such a book as "Through Space and Time" in a brief review. You must read it yourself in order to realize and appreciate its beauty, charm and simplicity.

**THE WHITE PYTHON.** By Mark Channing. J. B. Lippincott Company, Philadelphia, Pa. 320 pages. \$2.00.

In this very exciting and thrilling novel, of super-mystery and fantastic adventures in far-



off Tibet, we meet an old friend, one Colin Gray, who survived a tremendous amount of similar adventures in Mr. Channing's previous book "King Cobra," which I reviewed and recommended in one of our former issues.

Three men, all orientalist and collectors of Oriental treasures are mysteriously murdered in London. Robbery was apparently not the object, as nothing of their priceless things were missing. The British Foreign Office connects these murders with rumors that a red uprising is coming in Tibet, and Colin Gray is selected to go there and clear up the mystery. Through a series of letters published in the "London Times," which answer and attack an article: "The Decay of Buddhism," and which were signed: "S. Dod Chambers," he interviews the gentleman, who is a Tibetan Lama and sorcerer, the Lama Samdad Chiembra. The lama tells Gray, that these murders were committed by Tibetans, who were searching for a sacred scroll, which once belonged to him. He warns Gray that many dangers will beset his trails in Tibet, but that he Samdad will help him everywhere. He tells him of a legend, which has it, that a subhuman race of people dwell under the mountains on which his Lamassery is standing, and that these people worship the White Python. Through magic he shows him an enormous python, in whose coils is resting a beautiful girl, Gynia, high-priestess of the loathsome snake. He tells him that his adventures in Tibet will have much to do with the lovely Gynia.

On board ship he finds the Lama as a fellow passenger. He also meets and falls in love with Piers Bryan, whom the newspapers persist in calling "the world's most famous air-girl." Piers will attempt a solo flight from Calcutta across the Himalayas to Peking. Gray gives her a little silver token as a mascot. Piers takes off on her perilous flight, and Gray sets out alone for Tibet, which he reaches after many adventures. He meets his assistant, "K.B." of the East India secret service, and inquiring for any news of Piers, K. B. who is a very clever Babu and a medical doctor besides, hand him the little silver token which Gray had bought her in Calcutta. Even the friendly lamas of the Hlampo lamassery, where they have arrived in the meantime, cannot give any information about the missing flyer. At the last meeting with Samdad Chiembra, Gray had been instructed to search for a certain document in the library of Hlampo. Its finding reveals to him the plot of one Choryieff a Russian communist who attempts to establish himself as supreme ruler of Tibet. In Hlampo, Gray witnesses a gruesome rite; the revival of a corpse, but the dead man reveals to him the secret entrance to the subworld of Hlampo, and tells him that he will find Piers in caves of the White Python. In the meantime K. B.

has heliographed all the available information to his helpers located on distant mountain tops and requests planes to help capture Choryieff, who is assembling his army in nearby valleys. K. B. previous to all these happenings has cured Timor Khan, the hereditary Tibetan Chief of cataracts in both eyes, and the grateful chief promises to side with the British. Now Gray, helped by the magic of Samdad Chiembra invades the subterranean Kingdom of Gynia. Gray, meets Gynia, who is lovely beyond description, and she falls violently in love with him. Gynia believes that Gray, who is a handsome chap, over six feet tall and of herculean build, has come to marry her in order to fulfill an age-old prophesy, and by means of drugged wine he promises to do so. Gynia shows Gray the wonders of her subterranean kingdom, peopled with blind hideously deformed sub-humans, who for hundreds of years have been digging out enormous amounts of pure gold, which is lying around in the caves in large heaps of rubbish. In the dungeon caves Gray finds Piers, who miraculously survived when her plane crashed in the secret valley belonging to Gynia's kingdom. Choryieff who is after the gold hoard of Gynia, uses black magic, which he learned in Tibet and tells Gynia, that Gray is not a lama at all, but an English spy, and furthermore that Gray is in love with the British girl who fell from the sky. In jealous fury, Gynia has Gray cast into the dungeon, from which they promptly try to escape, but are recaptured. Now Gynia is really angry, and promises Piers and Gray, that both will be sacrificed to the white Python at the next Feast of the Serpent. Preceded by Gyalpo Magic, i.e. the slaughtering of the King of the sub-humans, the Feast of the Serpent starts. An enormous white python crawls out of its lair. Piers is thrown to the snake, but Gray attacks the serpent with his bare hands and with his superhuman strength tears the jaws of the snake apart, so that it perishes miserably. While this is going on, the benevolent magic of Samdad Chiembra is causing severe earthquakes within Gynia's domain. The internal flames which have been lighting the caves begin to burn with dangerous intensity, boiling springs and streams of red hot lava appear and in the confusion Piers and Gray escape to the upper world.

Samdad Chiembra helps them to capture Choryieff, on whose person is found the sacred scroll. Meanwhile British planes have come, and with Choryieff as their prisoner they start for India.

Seldom have I read a more exciting and thrilling story. It is packed with thrills—dangerous adventures—all kinds of magic—narrow escapes and rescues from cover to cover, and I am quite sure that every one of our readers will be thrilled by reading "The White Python."

# DISCUSSIONS

In this department we shall discuss every month topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

## Criticism Followed by Appreciation and Good Wishes

Editor, AMAZING STORIES:

I want to answer those readers who say that the plots of the stories in AMAZING STORIES are hackneyed, outworn, overused, and monotonous. Here, I believe, is the one occasion why they are such. Only a certain number of stories can be written about future wars and interplanetary conflict and exploration and intrigue. The authors write their stories by combining different parts of stories that they have read. Instead of having stories about these topics clutter up the contents every month of our magazine, why not have stories about social changes incident in interplanetary commerce. These two topics are only a few of the many which when drawn upon would not cause the readers to complain of hackneyed plots, *et cetera*. You already have some authors who excel in this style of story writing. These authors are D. H. Keller, M.D., Francis Flagg and Isaac R. Nathanson, to mention only a few. The best stories of last year, in my estimation, were "The Mentanicals," "Life Everlasting," "The Master Minds of Venus," "Shot Into Space" and the "Plutonian Drug." My favorite authors are Neil R. Jones, Dr. David H. Keller, E. E. Smith, Ph.D., John W. Campbell, Jr., Francis Flagg, Stanton A. Coblentz, Clark Ashton Smith and W. K. Sonnemann.

Why not return to the large size in May to celebrate the beginning of your tenth year of publication. Here are my reasons. Every month when I go to the newsstand to get my copy of A. S., I have to go into a regular Sherlock Holmes pose before I am able to find each month's issues. Imagine then, if you can, a person stepping up to the newsstand looking for something extra special to read. He won't paw through the magazines looking for something special, but will take the first thing that comes to his eye and why shouldn't it be a large size copy of A. S. with a comet heading.

I'm not one of those persons who yells "let's have stories like you used to have in '29, '30 and '31." I believe in progress and believe that the last few issues of AMAZING STORIES are better than many of the issues in those years.

To close, I want to protest, squawk, or whatever your name for it is. When do we get the Fearn serial "Liners of Time," promised us way back in the Fall of 1933; when do we get the "Skylark" stories in book form? Also to complete my files I would like to hear from

readers who have the issues containing "Blue Barbarians," "After 12,000 Years," any Campbell stories, any Smith stories, or what you have. I have a copy of Merritt's "Footprints to Saten" in book form in excellent condition for trade. I hope that A. S. will be "THE" Aristocrat of Science Fiction" as it has been so long and is now.

Robert E. Booth,  
Route 6, Box 158,  
Bakersfield, California.

(Your lists of leading authors who have written so many stories for us is of interest. It sometimes seems if we had ten or fifteen authors, as good as and including those you name, that they could fill our pages. But we believe in holding fast to old friends among authors, but also in making new ones.—EDITOR.)

## A Pleasant Letter of Helpful Criticism

Editor, AMAZING STORIES:

In view of the fact that I have never written in before, I have plenty to say; however, I will attempt to convey my humble message in as few words as possible.

Many of our readers have voiced their objection to stories by Jules Verne, E. A. Poe, and H. G. Wells. I have before me at present the April, 1926, issue of Science and Invention in which the statement is made that AMAZING STORIES has sole rights to all of Jules Verne's stories. In the Discussions department of the March, 1927, issue of AMAZING STORIES (the first AMAZING that I have with a Discussions column), I find the first objection to Jules Verne's works. Pity the poor editor. He can't throw away the material for which he has paid good money. In my opinion, a reprint Quarterly or Annual would be the most logical solution to the problem of presenting that type of literature to the public. Regardless of the manner in which it is handled, I shall continue to purchase or otherwise obtain my copies of AMAZING.

The series of stories that I have enjoyed most are the Professor Jameson stories by Neil Jones I have yet to read an uninteresting story by Mr. Jones. His stories do not equal E. E. Smith's, J. W. Campbell's, or Jack Williamson's stories for tenseness, action, etc.; but what they lack in action, they have in imagination and a clear, easy style that allows the reader to digest the contents without undue effort. Needless to say, I consider the four

authors mentioned in this paragraph to be in a class by themselves. Other authors have equaled the works of these four with one or maybe two stories, but have not been able to turn out consistent material of this nature. Please do not misunderstand me. I am referring to authors who deal with interplanetary stories.

One story that I consider a classic is "The Second Deluge," by Garret P. Serviss. Just recently, I dug out my old mags and re-read the story for the nth time.

The only comment that I have concerning the illustrations is that I did not care for Sigmond's work. I guess he was too futuristic for even me. Anyway, he is no longer with the mag, so that lets that criticism fall on a rock.

In the December, 1934, Discussions I note the letter from John Goldston. I must write him, for I think I can show an interest in all the hobbies he has mentioned, and then some. I am very interested in almost all branches of science; astronomy, chemistry, physics, biology, and radio—operate an amateur station under the call of W5BDI.

I intended to make this letter short; but unless I sign off pretty soon I am going to run off the page. Keep up the good work. I will try to send you my reactions more often now that I have at last started.

Ammon Young,  
4803 Eli Street,  
Houston, Texas.

(This letter is so clear that comment is not needed. It is a great help to the editor to know what stories and what authors his readers like. But there are many of our authors, whom you do not name, who are great favorites with AMAZING STORIES readers.—EDITOR.)

#### A Letter from a Young Reader Who Wants to Have Correspondence with a Kindred Soul Editor, AMAZING STORIES:

The January issue was the best yet! Every story was good and that's saying something, because of late your short stories have been lamentably punk. "Tale of the Atom" was the best short I've yet read in your magazine. It had a couple of errors in it, however, which didn't affect my liking for the story any. I don't see why the moon wouldn't come along with the earth, since the gravitation of the earth would have pulled it along. Assuming the moon did stay behind, I don't think water would rush out of the oceans and cover the land. The moon merely causes tides, it doesn't hold the oceans in place. Earth's gravitation does that.

As for rating the stories in order of merit, they were: 1. "The World Aflame"—Excellent. 2. "An Epos of Posi & Nega"—Excellent. 3. "Land of Twilight"—Excellent again. 4. "The Tale of the Atom"—Good. 5. "Contest of the Planets" looks good, but I'm waiting for

all three parts before I read it. By the way, why was the title changed? Had a swell time reading "Land of Twilight." First story I've read about life on Mercury. Come again, Mr. Preston.

I recently was fortunate enough to obtain some back numbers around 1930, containing "Skylark Three." I haven't read it yet, but I did read "Universe Wreckers" by Edmond Hamilton and "Non-Gravitational Vortex" by A. Hyatt Verrill. Why can't you get yarns like that nowadays? I also think the large size is much more distinguished looking. Why don't you go back to it on the next volume? I also saw some illustrations by an artist named Wesso. They were great. Second only to Dold. What happened to Wesso? Is he dead? That's the only reason I can think of for you to let him stop illustrating for you. If you let him go for any other reason you must be nuts. Get him back if you can, because he is very good.

Well, in closing, I'll say that you've started the New Year off right, keep up the good work and you'll have the best year yet.

I would like to correspond with anybody of either sex between 15 and 19 years of age, interested in Astronomy and space travel and who lives in a foreign country or west of the Mississippi.

Arthur L. Widner, Jr.,  
79 Germain Avenue,  
Quincy, Mass.

P.S.—I also saw in those old mags, a ballot for the reader preference of stories. Why don't you do this again? It will save a good deal of space in "Discussions" that would otherwise be taken up by ratings of the stories.

(The balloting which was adopted many months ago, did not receive so full a response as to encourage repetitions. As far as correspondence is concerned, quite frequently requests appear in "Discussions" for correspondents, so you may try some of these. We are quite anxious to have Discussions serviceable to our readers for this particular thing. The change in title of a story was an oversight.—EDITOR.)

#### A Very Pleasant Appreciation from New South Wales Editor, AMAZING STORIES:

Allow me to congratulate you on the last few issues, the general make-up is great. The story, "Velocity of Escape" deserves a sequel, I think. "Life Everlasting" was a very human story, indeed. The cover for August was as beautiful as the story it was from. Morey is certainly improving, though his faces are poor. All the serials were excellent except "Measuring a Meridian," by Verne. But I think everyone realizes that, though Verne was the master of science fiction, his stories are out of date.

There is a wealth of literary value in his works, but he is far too slow for these mad times. If the readers want reprints, give 'em reprints, *but what they want.*—Nuff sed.

Thank you for printing my previous letter. I have not received the issue yet; I have been aware of the fact from various correspondence, from all parts of the world, whom I want to thank. Best of Good Luck!

Cecil A. D. Sheppard,  
Albury Post Office,  
Albury, N. S. W.,  
Australia.

(We are glad to hear you received so many answers to your letter in the October issue of A. S. We hope to hear from you very soon again; our efforts meet with very acceptable appreciation from you.—EDITOR.)

### The City of Flint Has Been Too Retiring, Judging by This Excellent Letter

Editor, AMAZING STORIES:

I have never before seen a letter from Flint, one of our busy Michigan cities, in your columns, so here's hoping! First of all, I emphatically agree with Mr. Darrow in his January letter that A. S. should be printed on good paper, and the edges trimmed smooth. Remember, we are paying a quarter for the mag. After all, there are very few magazines at that price printed on pulp paper. I disagree with Mr. Darrow, however, when he says you should change the size back to 9 × 12 inches. The new size is much more convenient.

Another of Mr. Darrow's suggestions is also good. That about making Vol. 10 begin with the April issue. I have another idea of my own. Please, during the next volume, number the pages consecutively throughout the twelve issues. It is much easier to index the magazines when the pages are numbered this way and also to find an indexed story in one's bound volumes.

Now for some opinions on the stories. I believe that during 1934 the best serial you published was "Through the Andes," by Ver-rill; the best novelette, "Master Minds of Venus," by Sonneman; the best short story, "In the Footsteps of the Wasp," by Coblenz. I did not like the serial, "Land of Twilight" or "The Moon Waits." I think the short stories were all good.

Now about that vexing question—reprints. I believe that Poe's and Verne's stories are out of place in "our" mag., although they are great stories. I think you should reprint some of the good stories from your own early issues. That Summer Reprint Quarterly was swell, although I had already read two of the stories. Are you going to print "Skylark" in the next issue and when will it come out?

I see that 1935 will be a bang-up year for the S. F. fan. That story "The World Aflame,"

by Nathanson is a whole length ahead of any 1934 story, and "The Contest of the Planets" by Campbell starts out well.

Carl E. Woolard,  
2428 Gibson Street,  
Flint, Michigan

(As our heading implies we feel that Flint should have struck fire long ago. Your criticisms are interesting and it is pleasant to feel that we are starting the New Year with a story you praise so warmly as you do Nathanson's effort. He is definitely one of our favorite authors. We are glad that you speak a word for Campbell. You will like his interplanetary story.—EDITOR.)

### Flaws to Be Found in Some Interplanetary Stories

Editor, AMAZING STORIES:

To begin this missive, let me say that I am *not* making an attack upon AMAZING STORIES; I am *not* making an attack upon interplanetary stories; I am *not* making an attack upon any author; and that the following criticisms are *not* brickbats or complaints, but merely friendly attempts at pointing out some of the flaws in many interplanetary stories. My excuse for doing so is: "No fault can be corrected until once found." (As you can see by its awkwardness, the motto is of my own composition.)

First I shall tackle the question of acceleration on a space ship. Usually it may be the artist's fault, but I have noted that in most interplanetary stories the compartments of the space ships are arranged longitudinally, i.e., when the ship is cigar shaped, with propulsion tubes in the rear, the floors are parallel to the line of motion. Therefore if the rear rockets were turned on, every object in the ship would strive to move toward the rear; thus *along* instead of against the floor! Yet when the ship is accelerating, the occupants are always "pressed to the floor by the mighty hand of acceleration."

"But," you say, "usually the authors do not say how the compartments are arranged."

My answer to that is that directly they don't, but taking the drawing and several factors in the story, this conclusion is imperative. For instance, in Jack Williamson's "Prince of Space" (pardon me for digging out the dead and buried, but this story is freshest in my mind, as I just read it over) the space travelers board the ship when it is reclining on its side, like the usual airship. The floors are below them, and therefore must be arranged longitudinally. Yet when the ship leaves its berth, it slowly floats upward at first, then turns so its rear tubes point toward the ground, and roars upward. "Bill felt the pressure of his feet against the floor, caused by the acceleration, and sat down in a convenient padded chair." Actually, Bill should have been im-

mediately thrown off his feet to land with a squashy sound against the rear wall, being pulled in this direction by the combined forces of gravity and acceleration.

Another thing: Altogether too many authors seem to think of a space-ship as a cigar-shaped, easily maneuverable projectile in which the occupants sit or stand in perfect ease and comfort; being utterly oblivious of any change in weight due to acceleration, while the rocket tubes feebly spurt flame. Yet the speed of the ship seems to increase at a terrific rate, the rate of increase sometimes exceeding the figure which is the most any human can survive. (I do not recall the exact figure just now, and am too lazy to look it up.)

There is another mistake which is quite common. I shall give an example of this in Burt's "When the Universe Shrank."

The space ship—en route to Sirius—spends days and days and days and days accelerating to a speed sufficient to take it half-way to its goal! Midway it meets a Sirian ship traveling in the opposite direction at the same inconceivable speed. Yet, within a comparatively short time, the ships have completely stopped and engage in furious combat. Why, according to all laws, the speed should have taken just as long to stop as to build up. By that time they would have been so far apart as to make any connection impossible. Furthermore, the idea of two ships on such a long journey meeting by chance is rather improbable to say the least. Also the immense acceleration needed to make such a long journey could not be stood by a human, but that fact is excusable as it was used to make the development of the plot possible.

Another bug in my soup is the habit of some authors to set a certain limit to the speed of a space ship, such as: "The ship plunged on at its maximum of twenty miles per second, with its rockets belching flame." I recall a story (in another magazine, but as I am not criticizing merely A.S., but all interplanetary stories, I shall use it as an example) where the hero's space-ship could not keep ahead of the Martian villains, even when they had a several days' start, simply because their maximum speed was two hundred miles per second less than that of the other. The rockets seemed to be going all of the time.

Now on earth a vehicle can only go so fast and no faster because it pushes against something which is stationary. It can not increase its speed beyond that of the push minus air resistance. But in space the situation is different. In a rocket tube, the expanding gasses exert a force upon every side of the tube. The pressure toward the sides is equalized because there is an equal pressure upon both; both are pushed outward from the explosion. But the gasses pass unobstructed through the opening at the rear, while the force acts fully upon the

front. Therefore an unequal pressure is formed, causing the rocket to move forward.

Suppose the first explosion gave the rocket a speed of one mile per second. (This could not be the case as the acceleration would be too great, but I use it for convenience.) Then everything in the rocket would be traveling at exactly the same speed, and would seem stationary in relation to the rocket. In the second explosion, the fuel and all would *already* be traveling with the rocket at one mile per second. Therefore, when the explosion occurred, the gasses going backward would be stationary (in relation to the original position of the ship) while the gasses traveling forward would go at *two* miles a second. It's like kicking a football off a moving train, going sixty miles per hour. Suppose you can kick the ball to a speed of thirty miles per hour, and kick in the direction of travel? As the ball would travel thirty miles per hour in addition to the original speed of the train, it would travel at ninety miles per hour in relation to the ground.

Therefore, if the rocket reached a speed of four hundred miles per second, an additional "kick" of the rockets would always add another mile per second to the speed! It would continue indefinitely, always increasing until, perhaps attaining the speed of light, or when the fuel gave out.

I could add a few more words, but as this letter is already too long, I shall have to desist. I assure you once more that these criticisms have not been offered in the destructive spirit.

Oliver E. Saari,  
1342 First Street, S. W.,  
Rochester, Minn.

P.S. I have read the first two parts of the new Campbell serial, and I must say that it seems much more human than most of his previous stories. It is much better than the Campbell story that another mag is now running. It's the best you've had in a long time; Campbell is my idol, anyway. Imagine a hardened science-fiction reader like me actually getting a real kick out of a plot of *that* type! Only Campbell could do it. Please send me a time traveler (prepaid) so that I won't have to endure the agony between each installment.

(This is a most interesting letter. It suggests that we must assume such a thing as interplanetary license. It may require considerable of said license to write interplanetary stories, but what would be the measure of restraint for interstellar stories? How could the nearest star be reached in less than many years? Perhaps some of our authors will take up the gauntlet.—EDITOR.)

Socialism in Our Columns  
EDITOR, AMAZING STORIES:

I have received a good deal of unexpected but gratifying responses to my letter in the



December Discussions. The intelligence and potential understanding of the *science* of human relationships and conditions shown in these letters was really heartening. Of course, without such an understanding of the complexities of the society about us and the possible societies to come, few science fiction stories can be classed as truly great.

It is not enough merely to multiply the height of our present superstructures tenfold, describe for us in engaging fashion space-flyers of the future instead of our present means of conveyance or even substitute for the modern day hero's long trousers a pair of futuristic silk knickers and say, "Here is the future."

No. A deeper understanding of the forces at play about us is needed in order to develop the truly great science fiction stories. That has been my opinion for some time and the honorable exceptions to the rule of stories that either dared not or could not see straightly, only aggravated my objections to the *status quo*.

So with a growing feeling of delicious amazement I read these letters and my respect for the readers of science fiction increased enormously. While not even a majority were in agreement with my tenets, practically all possessed an alertness of mind well expressed by way of the written word. In fact, I was rather chagrined at my own poor knowledge and analysis of the state of affairs in science-fiction after digesting the contents of about ten letters. One of the repeated digs at my insistent complaints, that I cannot help but include here, was to the effect that if I don't like the science fiction published, why don't I write better? While this sounds almost analogous to the very fatuous "If you don't like this country why don'tcha go back to where you came from?" it is certainly not so. I believe that in that slam, at the likes of such as my humble self, lies the prerequisite to the enlivenment of science fiction. And apropos of that, haven't the editors of *AMAZING STORIES* and the other science fiction magazines frequently professed their desire to include all science fiction offered them in their pages so long as the stories are readable and interesting?

This set in motion the germ of an idea in this already uncomfortably overtaxed head. If so many of the established authors have so warped a view of the future why not give up trying to reform them and *even* the balance? Why not take pen in hand and—but you already get the idea.

Just so my friends. In this little room, my study, I have sworn a Spartan oath. With my hand placed solemnly on the cover of the April 1926 *AMAZING STORIES*, the thousands of books lining the walls around me showing up weirdly, almost alive in the flickering, shadow-casting light of my table lamp—3 A. M. (truly in the morning)—I make my vow!

Thus in this letter do I launch officially my drive for a new, vital, throbbing, *Intelligent* Science Fiction . . . stories revolving about the ever present struggle of humanity for a more glorious existence . . . but stories without that lack of an understanding of the *most* important science—the science of, in a very broad sense, Socialism. Although I am a Socialist I mean by the word used here a comprehension of the powerful antagonisms constantly clashing in uncompromising struggle—all arising from man's ever striving for that which is truth and beauty.

Still I cannot forego a word to our authors. There is for you, as yet little tapped, a tremendous source of material for your science fiction stories. It is material to be found in a class struggle in which we are all forced to take sides. I care not particularly which of the two contending camps you choose—the workers or the shirkers—but I do insist that you cannot portray the future without analyzing, however you will, this greatest of all conflicts. I take my stand here, for those who work by hand or brain; and let the line of demarcation henceforth be clear and sharp.

I will welcome answers to this letter in Discussions and if the answers are of a controversial nature promise to reply in rebuttal.

And let the chips fall where they may!

ARTHUR BERKOWITZ,  
1375 Grand Concourse  
New York City, N. Y.

(We do not feel that Socialism should be discussed in our columns. It is not easy to see how a story of the type, we believe our readers enjoy, could be based on political subjects. You will find some stories based on it, but the type is not that which we are striving for. The science we look for in the work of our authors is what is (crudely perhaps) called "natural science."—EDITOR.)

#### Amusing (P) Letter from the "Wilds of America"—Verne Criticized—The Large Size Again

Editor, *AMAZING STORIES*:

I quote from the letter of Mr. Laurent in your February issue: "Jules Verne's works were written many years ago and are still read. Why is that? Because . . . In everyone of his stories the science is exact." . . . etc.

In measuring a meridian, Verne does not have to step into the realm of the unproved. Let us see what happens when he does. In his "Trip from the Earth to the Moon," in which a projectile fired from the earth circles Luna and returns, Verne totally neglects the rotation of the earth in working out the course of his shot. Forgetting the pressure of several hundred pounds on his foot-wide glass windows, he permits his passengers to open and close them for a few seconds without the loss of a measurable amount of atmosphere. A person



reading "Off on a Comet" for astronomical information would be assured that Jupiter had four moons, Mars none; that Neptune was the outermost planet, and that a comet was a solid body of high density. So for science Verne was all right in his time; for fiction he is still splendid, but his science is hopelessly out of date. By the way; a projectile leaving the earth in the manner described by Verne would continue to rotate every twenty-four hours until stopped by some inside force. See why? This would be true of any body leaving the earth.

For another onslaught in "*A Matter of Size*". In the forty-four letters concerning the size of our favorite that have appeared since October, 1933, there have been thirty-one requests for the return of the large size. Thirteen said the small size was O. K. and of these only four had the nerve to come right out and say that they liked it. Does the majority rule? Surely the large size would give you an advantage over your contemporaries. Your magazine would be taken out of the "Wild-West" shelf and find itself in the sort of company it deserves—*Delineator*, *Red Book*, *Cosmopolitan*, *American*, *Popular Science*, *AMAZING STORIES*! Also, I would think that even a Ph. D. could see that all the readers of a certain other magazine which is printing a "Skylark" would be willing to pay fifty cents for a (Watch out, Mr. Hoskins) reprint of *The Former Skylarks*, or even one of them! It cost me a dollar to get hold of "Skylark Three", and at that I had a bargain. I now have on sale the issues of *AMAZING STORIES* containing . . . Wait a minute! I would not sell for anything short of five dollars the issues containing "The Skylark of Space." But I promise to buy a quarterly reprint of them anyhow. Please, Mr. Editor, come out from behind your editorial desk and say either "Yes!" or "No!" to our plea for a "Skylark" reprint.

A rocket would be practically unmanageable in a vacuum. Because of the total lack of resistance, the direction in which it was headed would have nothing to do with the direction in which it was going. An airplane can turn in comparatively small space, because as it turns from its course its former speed of flight is canceled by increased air resistance as it attempts to move through the air sideways. Even then it has to be "banked" or it "slips" in its former direction of flight. But a rocket has nothing to "bank" against. Therefore it must be brought to a halt in one direction under its own power before it can start in another. Otherwise its direction of flight would be a component of its old line of flight and the new direction in which it was being pushed. Which complicates things a little. With this in mind, what do you think of Mr. Skidmore's "Velocity of Escape"?

The lead slugs of my Royal Portable are be-

ginning to melt. Anyhow, this is as good a place as any to stop. This is the Voice from the Wilds of America, signing off.

W. B. (WILD BILL) HOSKINS,  
44 College Avenue,  
Buckhannon, W. Va.

(It is not clear how a rocket leaving the equator in a vertical direction with an approximate velocity of one thousand miles per second in lateral velocities referred to the equator, would double this velocity in going for instance four thousand miles of the vertical component of its motion. But this seems to be the meaning of your statement. We will take up the question of reprinting the "Skylark" stories with what result remains to be seen. We expect to retain the size of the magazine for the present. A rocket could be maneuvered in space to any extent by rocket discharges in different directions. Bow discharges could bring it to rest, lateral discharge could turn it, or could even replace the banking effect of air, which you cite. We shall always be glad to hear from you.—EDITOR.)

#### AMAZING STORIES in the *Fantasy Magazine* Editor, *AMAZING STORIES*:

Because of the fine work *AMAZING STORIES* has done to science fiction *FANTASY MAGAZINE* is dedicating its current issue to *AMAZING STORIES*. It will be sent free to any reader who asks for it, provided he has never been sent a copy previously. *FANTASY* is a fan magazine devoted to the interests of science-fiction lovers, and prints biographies and interviews with your favorite authors, news about what is happening in science fiction, articles by the world's leading science fiction authors and fans, etc.

JULIUS SCHWARTZ, Editor,  
87-36 162nd Street,  
Jamaica, New York

#### Notes on Our Magazine from an English Correspondent

Editor, *AMAZING STORIES*:

As for the stories, the best complete is "Eighty Five and Eighty Seven". The "Pool of Life" was interesting, while "Buried in Space" makes the usual mistake (to my mind) of thinking of space as being absolute zero. Space cannot be absolute zero, nor can it be at boiling point! Space has no temperature if there is nothing in it. The only thing that can have temperature is something in space, then the temperature depends upon its own heat minus that lost by radiation and plus that gained by the same means from any nearby sun.

"Moon Pirates" was nothing unusual, but I enjoyed the two chapters so far of Verrill's "Through the Andes". I nearly always like this author's South American stories. The

four page editorial, as usual, was excellent.

As for illustrations, I would prefer more variety, and would welcome back Wesso if you can persuade him to illustrate for you once more. I reckon he is the best stf. artist that I have seen. Some of Morey's drawings are good and others scrappy. Quite a number contain minor errors such as I have mentioned. One of these recently was in an illustration for the "Lost City" in the July issue. Mansfield should have been going upstairs not downstairs.

The best recent story (in my opinion) was "Photo Control" by Brown. I would like to see more of this type. It reminded me of the "old days" when A. S. was the premier stf. magazine—way back in 1930. . . .

You may be interested to know that I get the edges of my stf. magazines cut smooth by a printing firm for a cost of 1d. (2c.) each, and the difference in appearance is most remarkable. Please try and give us A. S. with even edges as soon as possible, still better, return to the large size. Your recent remarks about having to start at the beginning of a volume are promising if not convincing. If changes have to be made at the beginning of a volume why did you go into the small size in October last instead of April? It's no use trying to fool the readers of a magazine like A. S. for we all know you were pretty hard hit by the depression. Well, I'm renewing my subscription—and I hope others do the same. It would seem too much like deserting the old mag. not to renew it. Here's hoping you get back to normal times again, and that your circulation rises despite your rival's thought variants and the "Skylark of Valeron"—not that I hope any of your rivals goes down, but that you will both put out as high a brand of stf. as possible.

I would like very much to see the "Skylark Stories" reprinted in the Quarterly all together i. e. "The Skylark of Space" and "Skylark Three."

By the way, what's happened to "Liners of Time" by John Russell Fearn? I have read through some of the MS. when I visited Mr. Fearn over a year ago, and would have thought that you would have printed this story before now. What's happened to it? I hope you haven't lost it or forgotten it, for I thought this story one that seriously rivalled the "Skylark" series. Please look through your files to see if it is still there, will you?

Waiting for the return of the large A. S. together with the trailing cover-title,

Leslie J. Johnson  
46, Mill Lane,  
Liverpool, 13,  
England.

Hon. Secretary, The British Interplanetary Society.

P. S. Will all interested in the British Interplanetary Society please write to me?

(We have omitted the first portion of your letter as involving what may be called personal criticism. We quite appreciate the very nice way in which you place the subject of the temperature of space as there is nothing in space it is perfectly clear that there can be no temperature there, until some enterprising individual sends a rocket motor propelled car into the region of vacuum. "Liner of Time" we are publishing now.—EDITOR.)

#### A Good Letter from an English Reader Editor, AMAZING STORIES:

This is my first letter to you, so please treat me leniently if I criticize A. S. too severely, as I have the interests of the mag. at heart, and get a great deal of pleasure out of reading it. Although A. S. is not my favorite science fiction magazine I think it is quite a good production in most respects.

I have been reading it for less than two years, but have been fortunate enough to obtain copies from 1928 and at scattered intervals until the present. I hardly know whether I prefer the old large size or the present one. The present size is very convenient, but the old size somehow appeals to me. It seems customary to start one's criticism with ideas about your artists, so here goes.

I think that Morey's covers are rather poor. The chief thing that strikes me is the lack of colour in them. The January, February, March and June covers all seemed to be done in dull colours, greys and browns. One of the most noticeable features of Paul's covers are their vivid colours that are far superior to Morey's dull paintings. The inside illustrations are passable, and now and again are quite good, so perhaps there is hope, as you seem determined to stick to illustrations entirely by Morey.

Concerning the question of reprints. Why give us common ones by Poe and Verne? Yes, I know they are superb, but the great majority of readers can easily get hold of them elsewhere. If you must have reprints why not have those that very few can read elsewhere. I should not object if you reprinted a few of the greater stories from your earlier issues, if you are determined to have reprints.

Now I come to a vital question—your authors. Most of them seem all right to me, with a few standing well out. They are John Taine, Bob Olsen, David Keller, Fletcher Pratt, Captain Meek and Francis Flagg. I expect there are more, but I cannot remember them all. A great chorus immediately arises from the readers . . . "He's left out Edward E. Smith!!!" It is true. I greatly enjoyed what I have read of the Skylark stories, but I do not consider them much better than other medium stories. I have not read anything by

Abraham Merritt, so I cannot pass judgment.

Stories that impressed me particularly were "White Lily," "A Modern Prometheus," "Reclaimers of the Ice," "Cities of Ardatia," "Seven Sunstrokes," and "Peril Among the Drivers." These I consider the cream of those that I have read in about twenty-five issues, altogether. I have not seen anything of John Taine in recent issues, does he still write for you? The latest issues that I have had are the March and May for this year. Out of these two issues, "Peril Among the Drivers" takes first place. Then come "Dr. Grimshaw's Sanitarium" and "The White Dwarf." The latter is a fine piece of work. "Triplanetary" is not bad, like "Terror Out of Space." "The Lost City" promises to be fine; it is written in a good style and contains several ideas new to me. I should very much like to see a story based on Egyptology containing sound science.

There seems to be an increasing number of English readers, judging from "Discussions," but I do not agree with the suggestion to bring out an English edition of A. S. A little while ago, a science fiction weekly was brought out, but it had to give up in less than six months. While A. S. is far superior to it, I doubt if it would get on any better.

"Discussions," by the way, should be given another five sides, and some of the Editorial cut down. It seems far too long at present, but "Discussions" likewise seems far too short. Truly "Discussions" is a characteristic part of A. S., in no other magazine is it given so much space.

I can sum all this up into one sentence—A. S. is quite good, is better than it has been, and there is still some room for improvement.

In conclusion I would like to say that if any readers have back numbers that they would trade or sell, I should be pleased to hear from them. I especially want issues from 1926 and 1927, also the Annual.

Best wishes for A. S. for the future.

Maurice K. Hanson,  
c/o Mrs. Brice,  
Main Road, Narborough,  
Leicestershire, England.

(We are receiving a great many letters from other countries, England, Australia and New Zealand especially, and this letter is so well put that it speaks for itself. We feel complimented at getting such nice letters from readers thousands of miles away from us.—EDITOR.)

#### A Bibliography of Science Fiction Literature to Be Published

Editor, AMAZING STORIES:

We are publishing a complete bibliography of the rare and little known items of science fiction collecting. To supervise this work, we have engaged the services of one whom we

believe to be the foremost collector in this particular field.

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509 West 26th Street,  
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#### Notes on Various Stories—Our Short Stories Not Liked

Editor, AMAZING STORIES:

Mr. H. L. G. Sullivan's first story sure gives him a big start as a science fiction author. He handled the Moon story excellently.

Bob Olsen's tale was not up to the Olsen standard. I would like to see more of his "The Master of Mystery" stories or more of his Fourth Dimension works. There was no science in "Noekken of Norway" or at least I didn't think so.

The short was also a fizzler. Your shorts are not so hot. Make them better hereafter.

"Land of Twilight" is not so good as yet. Maybe it will get better.

The conclusion of "Through the Andes" ends a really good story. Mr. Verrill's South American stories are always good. Print more of his work, also more stories by Williamson, Skidmore, Vincent and E. E. Smith.

Olon F. Wiggins,  
2418 Stout Street,  
Denver, Colo.

(The "Olsen standard" as you term it, is hard to live up to. But "Noekken of Norway" gave the atmosphere of Scandanavia to perfection. The author and the editor of this magazine have travelled in Norway and the latter greatly enjoyed the story. More by Verrill is coming out soon.—EDITOR.)

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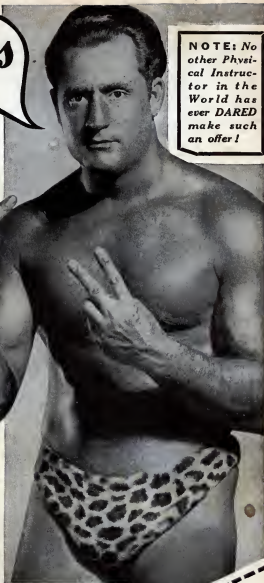
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10:00 p.m. E.S.T.  
9:00 p.m. C.S.T.  
8:00 p.m. M.S.T.  
7:00 p.m. P.S.T.

**THURSDAY**

9:00 p.m. E.S.T.  
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7:30 p.m. M.S.T.  
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